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ABSTRACT

The decline in black fertility after the Civil War to its lowest level about the year 1936 does not fit the typical demographic transition pattern in which fertility declines postdate the initiation of mortality declines. Instead, for blacks much of the fertility decline (56 percent) was due to "involuntary infertility" related to venereal diseases. Circumstantial and historical evidence make a compelling case for venereal disease having a strong impact on black fertility, but a stronger link can be established between the two by using geographic techniques. Within the six-state region of the southeastern United States, the incidence of syphilis among black males, as discovered by the Selective Service in 1940-41, was related to the spatial pattern of black fertility by county in the same year, with the two variables correlating at fairly high levels. After World War II, black fertility rose dramatically due to the prevalence of antibiotic treatment for venereal disease. The pattern of fertility in 1960 showed substantial increases in virtually all counties in the six-state region and more particularly in those areas where fertility had been most depressed. After 1957, black fertility again began to decline. This time it was deliberate, owing to the increased adoption of family planning and the initiation of the final phase of blacks' true demographic transition. (CMG)

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East-West Population Institute
East-West Center
1777 East-West Road
Honolulu, Hawaii 96848

Director *Lee-Jay Cho*
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A false fertility transition: the case of American blacks

Paul Wright
and Peter Pirie

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PAPERS OF THE EAST-WEST POPULATION INSTITUTE

PAUL WRIGHT is Assistant Professor, Department of Earth Sciences, University of California at Riverside. PETER PIRIE is Professor of Geography, University of Hawaii at Manoa, and Research Associate at the East-West Population Institute, East-West Center.

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PREFACE

This paper was begun when we were both at the East-West Population Institute, East-West Center, and the Department of Geography, University of Hawaii at Manoa. Since then Paul Wright has joined the Department of Earth Sciences at the University of California at Riverside. The East-West Population Institute has continued to support the work to completion. An earlier version of the paper was presented at the Annual Meeting of the Association of American Geographers, New York, in 1976.

Two anonymous reviewers gave us helpful advice, which improved the final product. We remain responsible for the advice we did not take and for the work as a whole. Sandra Ward edited the paper with skill and care, and we are grateful to her, to Lois Bender, who did the typesetting, and to Gregory Chu, who did the cartography. Alice Harris and her staff of the institute's Resource Materials Collection were consistently helpful.

ABSTRACT The decline in U.S. black fertility after the Civil War to its lowest level about the year 1936 does not fit the typical demographic transition pattern. Black life expectancy did not begin to increase perceptibly until the 1920s, and the economic and social environment of blacks, particularly those in the rural south, was unhelpful in lowering fertility.

This paper attributes much of the fertility decline to "involuntary infertility" related to sexually transmitted diseases, particularly gonorrhea and syphilis, and their sequelae, principally pelvic inflammatory disease leading to subfecundity and infertility, together with pregnancy wastage through involuntary abortion and stillbirth.

The cumulative increase in the incidence of venereal diseases among U.S. blacks is traced from the days of slavery through Emancipation to World Wars I and II. The possibility that blacks adopted contraception on a progressively large scale before the 1930s is examined and largely dismissed.

Circumstantial and historical evidence makes a compelling case for venereal diseases having a strong effect on U.S. black fertility, but it proved feasible to establish a stronger link between the two by using geographical techniques. Within the six-state region of the southeastern United States (South Carolina, Georgia, Florida, Mississippi, Alabama, and Louisiana) the incidence of syphilis among black males, as discovered by the Selective Service in 1940–41, is related to the areal pattern of black fertility by county in the same year. It proved possible to correlate the two variables at a fairly high level and to find explanations for the variations related to differential social and economic conditions within the region.

After World War II, U.S. black fertility rose dramatically. The rise was related to the prevalence of antibiotic treatment for venereal diseases, allowing many blacks to realize a long-thwarted desire for larger families. A slight increase in fertility had occurred after about 1936, which was related to improved general health, the use of sulpha drugs, and more vigorous action by federal and state authorities against venereal disease. The pattern of fertility in 1960 showed substantial increases in virtually all counties in the six-state region and more particularly in those where fertility had been most depressed. Using several methods, we estimate the physiological impact of the venereal disease-related infertility as having accounted for about 56 percent of the total fertility decline before 1936. The remaining 44 percent would be distributed among such causes as inadequate statistical data, which we see as weakening our case; other pathologies, such as tuberculosis, pellagra, and malaria; and deliberate family limitation, concentrated first among the northern urban blacks, but having a progressively greater effect on all blacks during the period.

After 1957, by which year black fertility was at a level not achieved since 1910, fertility again began to decline. This decline we see as largely

deliberate, owing to the increasing adoption of family planning methods and the initiation of the final phase of blacks' true demographic transition. The effects of the prevalence of venereal disease are now difficult to gauge, but it must have blighted hundreds of thousands of black families. Instead of 26 million, the number of blacks recorded by the U.S. census in 1980, the black population, without the "involuntary infertility effect," would probably have been at least 45 million. Although the magnitude of the problem has been greatly reduced, it has still not evaporated; nearly one million cases of pelvic inflamatory diseases still occur every year, the venereal diseases are having a troubling resurgence, and blacks in the southeastern states are still disproportionately affected.

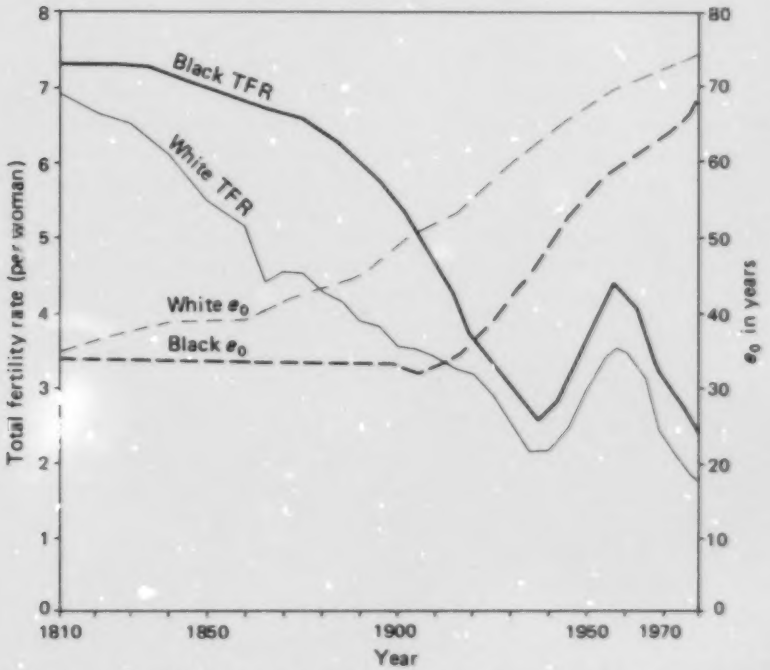
A sustained fertility decline among the black population of the United States, beginning after the Civil War and ending about 1936, is now well established (e.g., Eblen, 1974; Coale and Rives, 1973). During the late 1930s, this trend was reversed and black fertility reached a peak in 1957 of over 60 percent above the 1936 low. By 1960, another decline, which is still continuing, had become apparent (Figure 1).

The trend in black mortality, expressed in Figure 1 as expectation of life at birth (e_0), is not so well established; but it appears to have remained at a relatively constant level (about 30–34 years) until after World War I, when some improvement became apparent. Recent levels (1981) are close to 70 years, still about four years below that for the white population. For the black population mortality remained virtually unaffected by improvements in medical care or environmental sanitation for over a century after the white population had begun to benefit significantly from modern health development. From a level similar to that of the black population around 1810, the white population achieved an expectation of life of about 40 years in 1865 and about 52 years in 1910. Another implication of the curve showing expectation of life for blacks is that, before it achieved any significant upward movement, over half of the total decline in black fertility, as shown by a drop in the total fertility rate (TFR) from about 7.0 per woman prior to 1865 to about 4.75 in 1910, had already been accomplished.

BLACK FERTILITY TRANSITION: DELIBERATE OR INVOLUNTARY?

These characteristics, at odds with the traditional demographic transition model, are both unexpected and unusual. According to

FIGURE 1. Trends in total fertility rates (TFRs) and expectation of life at birth (e_0) for the white and black populations of the United States, 1810–1979



SOURCES: Eblen (1974); Coale and Rives (1973); Demeny and Gingrich (1967); Coale and Zelnick (1963); U.S. Bureau of the Census (1982).

transition theory, declines in fertility should postdate, usually by several decades, the initiation of mortality decline. The mystery is deepened further by the absence of any discernible parallel improvement for most blacks in conditions usually associated with voluntary fertility limitation. Instead, in the two decades between 1937 and 1957, during which black fertility rose dramatically, their living standards began to benefit from rapidly improving economic conditions related to the New Deal and World War II, together with the mounting assertion of black civil rights and the rising conscience of white Americans.

A complicating factor in the interpretation of the causes of this fertility trend among U.S. blacks is the relationship the trend shows with that of the white population. Although consistently higher, the black TFR declined in tandem with the white after 1870 and since 1915 has generally tracked within less than 1.0 difference with almost uncanny precision. The temptation to assume that the two populations are responding to the same set of causes is great. "[Data] . . . suggest the demographic transition as a national process affecting both the majority population of largely European origin and the minority of largely African origin, though with difference in timing" (I. Taeuber and C. Taeuber, 1971: 379). Somewhat more cautiously, Coale and Rives (1973: 30–31) have stated:

> A puzzling feature of the time pattern of black fertility is the beginning of a very steep and sustained decline as early as 1880. The black population in the United States remained almost entirely Southern and rural until 1900. To a high degree it was substantially less urban than the white population in 1930. . . . Moreover our estimates show little change in mortality between 1880 and 1900. . . . In short the black population in the U.S. does not appear to be a population that was ready for demographic transition beginning in the 1880's. One interpretation of the decline is that it represents a diffusion of attitudes and practices from the white population in which the decline in fertility had begun much earlier and had proceeded far by 1880.

It was to test this process, using a diffusion model on fertility changes, that our study was initiated.[1] We began by mapping the child-woman ratios (CWR) by county in six southeastern states: Alabama, Florida, Georgia, Louisiana, Mississippi, and South Carolina. The geographical pattern of implied fertility shown by the census data for 1930 and 1940 was not one that could have been expected on the basis of the demographic transition.

By 1960, fertility levels, although much higher overall than in the earlier censuses, did vary areally in a more traditionally explicable pattern. These spatial patterns for 1930, 1940, and 1960 are shown and discussed in detail later in the text.

The peculiarities of the 1930 and 1940 fertility distributions, particularly the occurrence of extremely low fertility among blacks in many of the least developed and most poverty-stricken counties, led

1. As the model is not pertinent to the study as it evolved, we do not discuss it in this paper. Interested readers are referred to Demko and Casetti (1970).

us to invoke another model, that involving progressive involuntary subfecundity related to disease, as a major factor in the decline.

The possibility of disease-induced subfecundity in relation to the U.S. black population has been raised before, notably by Reynolds Farley in his work *Growth of the Black Population* (1970: 222–35). Farley concludes:

> As far as we can detect, this decrease [in black fertility] was chiefly brought about, not by changes in marital patterns or the increased use of contraceptives, but by alterations in health conditions which were unfavorable to fecundity (p. 243).

Farley examined the role of venereal diseases and pellagra in some detail before coming to this conclusion. In this paper we focus on the contribution of sexually transmitted disease (STD) to this situation, without necessarily discounting the possibility that other medical problems, an increasing use of birth control, changes in marital stability, mate exposure, and family structure also contributed to the decline.

The sexually transmitted diseases involved are principally syphilis and gonorrhea. The role of gonorrhea in causing pelvic inflammatory disease (PID) has been well established; but other microorganisms, notably *chlamydia trachomatis* and *mycoplasma hominis*, have also been implicated (St. John and Brown, 1980). In the literature of the day, between the 1880s and the late 1930s, only syphilis and gonorrhea are identified as widespread venereal diseases among blacks. Chancroid, which does not appear to affect fecundity, was also referred to occasionally. Salpingitis, inflammation of the fallopian tubes, is attributed to gonorrhea in virtually all cases. The possibility of other agents such as chlamydial infections or other known causes such as induced abortion, various gynecological procedures, and of course IUD insertion, is not raised. Nor did we find the suggestion in this literature of the probability that one of the consequences of salpingitis is increased risk of ectopic pregnancy, now known to be a factor in fetal wastage. It seems that several of these factors have increased in their frequency in recent decades or have only lately been recognized (Westrom, 1980). Since none of these agents could be successfully treated during the period in which most of the fertility decline occurred, it is not of great importance if agents other than gonorrhea are involved in salpingitis if they too are sexually transmitted. The outcomes, subfecundity and increased sterility, are the same and their incidence is likely to be correlated.

Historical precedents

An accumulating body of evidence suggests that, historically, venereal diseases have been effective in depressing fertility in several populations. In a variety of documented instances, low fertility, slow population growth, or even depopulation has been associated with a prevalence of venereal diseases throughout an entire society. One of the earliest and most detailed of these cases, studied by a medically qualified investigator, occurred in the New Ireland district of New Guinea (Scragg, 1954). Studies by Underwood (1973) and Lessa and Myers (1962), dealing with specific cases in the Pacific Islands of Yap and Ulithi, respectively, support a similar conclusion. Pirie (1972) reviewed evidence of the effects of gonorrhea and syphilis on fertility in the Pacific Islands, discussing the possible effects also in Hawaii, the Marquesas, the Society Islands, several Micronesian islands, and among the New Zealand Maori.

In Southeast Asia, the case of the Muruts in Borneo described by Clark (1951) and Polunin (1958) implicates gonorrhea. Populations showing low fertility are found in several places in tropical Africa. Researchers studying these populations have identified gonorrhea and in some cases syphilis as major agents. Griffith (1963) noted a high correlation between fertility variation and reported rates of gonorrhea in different areas of Uganda, for instance. Arya, Nsanzumuhire, and Taber (1973) came to similar conclusions in an examination of two Ugandan districts of contrasting fertility. The low-fertility group showed a high incidence of PID and gonorrhea, whereas much less was observed in the district with high fertility. Romaniuk (1968a) investigated low fertility and infertility in Zaire and cited both gonorrhea and syphilis as probable causes. In another paper, he reviewed several cases derived from the literature on the relation between incidence of venereal diseases and low fertility in African societies (Romaniuk, 1968b: 214–24). Several papers given at the Symposium on Pelvic Inflammatory Disease held in Atlanta in 1980 provide additional evidence of such a relationship (e.g., Arya, Taber, and Nsanze, 1980; Muir and Belsey, 1980; Ratnam, Din, and Chatterjee, 1980; and Perine et al., 1980). The number and variety of these cases suggests that when populations with prevalent but apparently involuntary infecundity and childlessness are observed we should be alert to the possibility of a causal relationship with venereal disease.

Conservative interpretations

The possibility of venereal disease being a major cause of low fertility has not been readily accepted by all researchers. Joseph A. McFalls, for instance, after reviewing Farley's work, offered "a more conservative interpretation" of the importance of the effect of venereal disease on black fertility, and after assessing the possibilities as he saw them came to the conclusion:

> The black fertility trend was probably fashioned by essentially the same traditional factors that determine its white counterpart. . . . It is difficult to support the hypothesis that the explanation of the black fertility trend is unique or radically different from that of the white counterpart (McFalls, 1973: 18).

More recently, Stanley L. Engerman (1978), an historian associated with the controversial work *Time on the Cross: The Economics of American Negro Slavery* (Fogel and Engerman, 1974), reviewed the decline in black fertility over the period 1880–1940. He suggested that such writers as Farley neglected socioeconomic factors in explaining the decline, and described the quantitative effects of venereal diseases on fertility, in his only reference to the matter, as "dubious" (p. 103). He concluded on an uncertain note:

> It is possible that factors relating to slavery did delay onset of the transition and can explain the lag of the U.S. black population behind the white in marked declines of fertility. To study that we need to know more about the determinants of fertility in the slave period, ... [W]hile the situation of American blacks in the years between 1880 and 1940 was in many ways clearly different from that of other groups, it seems that in the cross-sectional differences, as well as the movements over time, much of the black fertility pattern resembles that of the whites of the United States and elsewhere, as well as that of the free black populations in other parts of the Americas (Engerman, 1978: 153).

THE INVOLUNTARY SUBFECUNDITY HYPOTHESIS

We believe it is now possible to be considerably more definite about the causes of fertility decline among blacks after Emancipation, which we see as premature, largely involuntary, and propelled by forces very different from those affecting the proximate but virtually separate white population. We shall examine the fertility trends of blacks and gauge the degree to which the movement and timing of those trends

is better explained by the involuntary subfecundity hypothesis than by the demographic transition theory. The potential effects of sexually transmitted disease on fertility will be discussed and the trends in the incidence of fertility-inhibiting diseases among U.S. blacks assessed.

We use a model to test the relationship between black fertility in 1940 and the contemporaneous incidence of syphilis as indicated by the U.S. Selective Service data for the counties of the six selected states. Those states have the highest proportion of blacks in the general population, and for almost all counties in them the results of serologic tests for syphilis performed on military draftees, vital statistics, and census data on blacks are available or can be estimated. With the partial exception of Florida, those states also contained the poorest blacks and the highest proportion of blacks engaged in agriculture. If the involuntary subfecundity hypothesis is valid, it should have its greatest explanatory power in this region.

Some cautionary explanations are necessary at this stage. This paper is by no means the complete and unassailable statement we should have liked to make. Data on venereal diseases are notoriously elusive; and historical records, particularly those relating to the 1930s or before, are full of traps, omissions, confusions, and, in the light of hindsight, obvious misinformation. Even our most comprehensive data —those on U.S. blacks by county collected in successive U.S. censuses— are known to be faulty and to have been subjected to "corrective adjustment." The registration of births to blacks in the six states was usually deficient. Data relating to the physical examinations of recruits in World War II by the Selective Service Boards, as they refer to venereal syphilis, are incomplete. For the rest, we rely on small-scale studies that in most cases had intentions very different from our own. Although these data generally support our thesis, we believe that had they been better, the support would have been more positive.

Venereal disease and fertility

It is rare to find concise information about gonorrhea and venereal syphilis as they affect fertility. One source of confusion is the tendency of writers to lump the two together as "VD" (venereal disease). Although it is true that "their mode of transmission, modern treatment and prevention differ only in detail" and that "both diseases flourish under the same combinations of demographic and socioeco-

nomic conditions," it is not true that "syphilis and gonorrhea are quite similar" (McFalls, 1973: 8). Their periodicity, symptoms, sequelae, and effects on the process of childbearing are very different. When examining them for their demographic effects, it is therefore preferable to treat them separately.

Characteristics of gonorrhea

The best-documented effect of a venereal disease on fertility is that of gonorrhea. In societies where sexual mores dictate or tolerate frequent intercourse involving a variety of partners for at least a segment of the population, particularly if this segment is the young, the setting is ripe for a high incidence of gonorrhea. The only other necessary condition is a readily available reservoir of infection. In the case of U.S. blacks, this resource was originally supplied by the U.S. whites. Under such conditions, if gonorrhea is not rampant, the question to ask is "Why not?" Possible answers could be that the disease has not been introduced (as in precontact Tahiti) or that the population is educated to seek prompt and effective treatment with antibiotics (as is largely true in many modern Western countries). In the situation described—a situation that existed among a substantial proportion of the U.S. black population after Emancipation and before the development of antibiotic-based health programs—gonorrhea will work insidiously but effectively to lower fertility.

Among women, about 15 percent of all cases of gonorrhea will result in pelvic inflammatory disease (PID). In the literature we have been using, the condition is usually described as salpingitis. The fallopian tubes become obstructed by scar tissue caused by inflammation. This condition reduces the chance of conception and renders the victim completely sterile in about 20 to 30 percent of all cases (Wilcox, 1964: 679). Among blacks during the period under review, the damage must be considered irreversible. Whereas female gonorrhea is frequently asymptomatic, salpingitis is usually, but not always, noted and remembered as painful.

Among males, untreated infection may cause epididymitis, which occurs in about 20 percent of all cases. Of these, about one-third results in complete sterility (Pelouze, 1939: 240).

The short incubation period of gonorrhea, about three days, permits its rapid spread, and one attack provides no immunity from a subsequent infection. The disease recedes spontaneously, and victims

remain infectious for only a few months and certainly less than one year unless complications are severe.

Characteristics of venereal syphilis

The symptoms of syphilis, initially skin lesions and, later, involvement of the central nervous system, leading to physical deterioration, insanity, and, in many cases, death some decades after the initial infection, are much more dramatic and destructive than those of gonorrhea. As a result, syphilis received far more medical and societal attention than gonorrhea in the preantibiotic past. We are primarily concerned, however, with its impact on fertility.

Several studies have tested the effect of venereal syphilis on fecundity (e.g., H. Solomon and M. Solomon, 1920; Parker, 1929; Fellows and Perry, 1941; and Stix, 1941b). Conventional medical wisdom has it that syphilis itself does not inhibit the ability of a woman to conceive nor of a man to impregnate her. It is well established, however, that a syphilitic mother, particularly in the early stages of the disease (usually within two years of contracting it), is likely to transmit it through the placenta to the unborn child. The results frequently include spontaneous abortion, miscarriage, and stillbirth. Many infants successfully carried to term are congenital syphilitics having varying degrees of damage, which may preclude their survival or lower their resistance to other risks of mortality.

For our purposes the best study is that by Stix (1941b), who compared two groups of black women in the South (Spartanburg County, South Carolina). One group showed positive reactions to a test for syphilis or had a history of previously diagnosed syphilis; the other showed no evidence of syphilis. Excluded from both groups were women who practiced contraception, had a history of gonorrhea or were currently infected, or were found to have any pathology that might have inhibited their fertility. Stix estimated the effective fertility—that is, live births—to be 23 percent lower among women with syphilis than among the "nonpathologic" group (p. 299). This appears to be the best estimate available.

The relative incidence of the venereal diseases

The method of gonorrhea and syphilis discovery under mass survey conditions, such as those conducted by the U.S. Selective Service Boards, requires some explanation. In most cases, tests show positive

reactions to antibodies, indicating venereal syphilis. Antibodies develop shortly after the disease has been contracted, and positive reactions to them persist unless successful treatment is completed or, failing this, voluntary remission occurs. Voluntary remission happens in about one-fifth of male and two-fifths of female untreated cases after 15 or more years of infection. The commonly noted increase in syphilis occurrence up to about age 40, and a decline in the rates at later ages, reflect this pattern of remission. Reinfections are possible but can occur only when the development of antibody reaction is aborted, for instance after early and completely successful treatment.

Gonorrhea cases, by contrast, are likely to be recorded only during the short period of infection (and often not even then, as diagnosis is not a simple matter) or when recollected as a past event by patients, more commonly by men than by women. The detailed examination of damaged organs leading to the discovery of fertility-inhibiting sequelae may indicate other past infections.

Most cross-sectional surveys, therefore, underestimate the prevalence of gonorrhea. The chances of any one syphilis infection being observed in a cross-sectional screening system are much greater than that of any one gonorrhea infection, making suspect the common clinical opinion that gonorrhea is always about four times more prevalent than syphilis.

Information gained from data on new cases reported gives a better indication of the relative incidence of the two diseases, but even with these data there are problems. Only in regimented populations are the data reasonably complete. Military records are probably the best available. Those of the U.S. Navy, as kept from 1914 to 1940, show a consistent ratio of 3.6 new gonorrhea cases to every one new syphilis case (Stephenson, 1940: 407). Disaggregation of the data may reveal different situations. For instance, U.S. Navy data for 1923, while showing that reported gonorrhea cases outnumbered those of syphilis by 4.2 to 1, also showed that the ratio was highest among the 16–19 age group (8.3:1) and the 20–24 group (5.0:1). It decreased thereafter, to 1.0:1 for the 45–49 age group. In commenting upon these data, the Surgeon General stated that it was likely that old cases of syphilis were being discovered among the older age groups and that gonorrhea was more likely than syphilis to go unreported (Surgeon General, U.S. Navy, 1925: 156). By 1940, U.S. Navy authorities were reporting a gonorrhea/syphilis ratio of 7.4:1 (Stephenson, 1940: 407).

The hypothesis that U.S. black fertility was significantly reduced by venereal diseases does not necessarily imply that most, or even the majority, of blacks were actually infected. What is suggested is that a relatively large proportion contracted the disease early in their sexually active lives and, in the case of gonorrhea, suffered repeated subsequent infections. Throughout this period there was always a proportion of the black population characterized by stable marriage, loyalty to one mate, and fertility that was limited, if at all, by voluntary methods.

Evidence is elusive, but two studies suggest the relative incidence of gonorrhea and syphilis and point up the possibility of repeated attacks of gonorrhea.

In a confidential survey of black males, conducted in several industrial cities of a southern state in the early 1920s, respondents were told about the symptoms of gonorrhea and syphilis and asked to list their experiences with both diseases. Of the 888 replies, 8 percent indicated an experience with syphilis. An additional 4 percent of respondents admitted to having had a "sore" near their genitals, which in most cases, the study report suggests, would also have been syphilitic. The survey findings indicate an incidence of syphilis of between 80 and 120 per thousand in this group. Gonorrhea was reported by 54 percent of respondents, and among them the average number of instances was 1.7, resulting in a total incidence of 815 per thousand persons. The average age of those admitting to venereal diseases was 25 years, so that the probability of reinfections, in the case of gonorrhea, must have been quite high (Anonymous, 1924).

In the second study, 412 male patients, of whom 406 were blacks, were interviewed at a Delaware syphilis clinic in 1943. Of the total, 374, or 91 percent, also admitted to past histories of gonorrhea or were found to be currently infected. The average age at the time of the first attack was 19 years. Those who gave past histories of gonorrhea indicated a total of 787 attacks, an average of 2.1 per person (Cameron and Chapman, 1944: 239).

These studies do not indicate with certainty the prevalence of the hypothesized situation, and the populations questioned were not necessarily typical, but they are suggestive of the situation we believe to have been common.

The effect of venereal disease on fertility characteristics

In populations stricken with high levels of venereal disease, fertility patterns acquire distinctive characteristics that in turn may become symptomatic of the disease. Two of these are age-specific fertility rates of unusual form and, among women, high levels of childlessness. The typical pattern for age-specific fertility rates in these cases is of high levels in the first quinquennium of the reproductive age range and a noticeable decline thereafter. This pattern, in contrast with the more usual type, which peaks in the 20–24-year age group or even later, reflects sexual behavior patterns characterized by early initiation, high levels of activity and partner change, and little or no attempt at contraception, resulting in initially high fertility. Subsequently the proportion of potential parents affected by venereal diseases and fecundity-inhibiting sequelae increases, and fertility progressively declines. The contribution of syphilis to this sequence is much less than that of gonorrhea; but to the extent that most cases are acquired at young age—that is, in the late teens and early twenties—and the effect is greatest soon after infection, a high incidence of syphilis will reinforce the gonorrhea-induced pattern to some extent.

To illustrate the contrast between a population markedly affected by fertility-inhibiting disease and one not discernibly affected, we show in Table 1 two populations, the first a black rural population

TABLE 1. Age-specific fertility rates for two populations

Age group	A U.S. black population in rural Mississippi Delta area, 1939–40 (a)	Malay population in Malaya, 1957 (b)	Ratio (a):(b)
15–19	166.3	162.6	102:100
20–24	163.9	341.9	48:100
25–29	124.4	279.3	45:100
30–34	86.3	207.9	42:100
35–39	57.0	146.3	39:100
40–44	16.6	55.3	30:100
45–49	3.3	16.3	20:100
Total fertility rate	3.089	6.048	51:100

SOURCES: Vandiver (1950: 78–84); Fell (1960: 42).

observed in the Mississippi Delta area that had high rates of venereal disease, and the second the ethnic Malay component from the 1957 Census of Malaya. We chose the latter as being typical of a rural, peasant, pronatalist society with a level of fertility for the 15–19-year age group that is similar to that of the black example. Malay fertility was then little affected by either venereal diseases or family limitation. The two patterns diverge markedly. The contrast deepens with age, but the greatest differences develop early. In the 20–24 age group fertility among the Delta blacks was less than half that of the Malays. For this black population fertility was not, in fact, very low. The TFR of 3 is above replacement level even allowing for high infant mortality.

The other diagnostic trait giving a strong presumption of the gonorrhea effect is a high proportion of childlessness. In any given population some women will be physiologically incapable of bearing children and an additional group will for various reasons choose not to. Among U.S. blacks before 1960, particularly in the rural South, we can find little in the literature to indicate that disinclination played more than a minor role. We interpret the rising fertility between the late 1930s and the late 1950s as strong evidence of a previously thwarted desire for more children by many black families. The timing of this increase has parallels in several other populations. For instance, in the Pacific islands it is seen as associated with improved public health and, particularly after World War II, with the widespread use of the antibiotics (Pirie, 1972: 199).

The proportion of women who are barren in populations relatively free of fertility-depressing diseases, but in which marriage is virtually universal, usually does not exceed 5–7 percent of the whole. Where there is little or no evidence of voluntary causes, involuntary mechanisms, principally related to the effects of venereal disease, must be suspected. The 1835–39 cohort of ever married black women (those whose reproductive lives spanned the years 1850–80) reported 5.6 percent childlessness. This is a normal level, which leaves little room for voluntary childlessness. It supports the common observation that black social norms of this time encouraged childbearing and large families, since this group reported an average total of 6.9 children. In contrast, ever married women born to the 1905–09 cohort, whose reproductive span covered the 1920–50 period, reported 28.4 percent childlessness and 2.7 children as the mean completed family size (I. Taeuber and C. Taeuber, 1971: 378). An indication that social atti-

tudes had not veered away from large families completely lies in the finding that, of this cohort, 13 percent achieved completed families of seven or more children. But the implication here is that a large segment of the black population was no longer characterized by "traditional" fertility.

Family limitation among blacks prior to World War II

One of the problems faced by those who see the earlier decline of fertility among blacks as being largely deliberate or voluntary—that is, as a movement parallel to the contemporary white trend—is to explain the means by which blacks were able to achieve such low fertility levels within an unhelpful demographic and social environment. The widespread use of birth control is the most obvious possibility, and this hypothesis has been addressed in a recent paper (McFalls and Masnick, 1981).

While admitting that "little is actually known about the use of birth control among blacks from 1880 to 1940," a view with which we hasten to agree, McFalls and Masnick remind us that all societies know of, and practice, some forms of fertility limitation (McFalls and Masnick, 1981: 92). Induced abortion and some forms of contraception, notably male withdrawal (and presumably also prolonged breastfeeding), were known and practiced both in tribal Africa and among the American slave population, although at what scale and to what effect cannot now be known. McFalls and Masnick disagree with the view that few blacks used birth control during the 1880–1940 fertility decline. They also question the notions that black contraceptors failed to affect their fertility levels significantly because they used inefficient methods (e.g., douche and male withdrawal), did not use their chosen methods efficiently, or adopted family planning so late in their reproductive careers that it could have little demographic effect. The evidence assembled in their paper to support their position can only be described as slender, but their opinion is difficult to contradict for the same reason—solid evidence on this matter is deficient.

More objection may be registered to their dismissal of the first survey attempts, made in the 1930s, to measure the prevalence of birth control among blacks (McFalls and Masnick, 1981: 99). The most ambitious of these was by Raymond Pearl in 1931–32 (Pearl, 1936a and 1936b). Of a total of nearly 31,000 reproductive case histories collected by attending doctors at confinement from women who gave

birth in cooperating urban hospitals in large cities of the northeastern states, 5,633 were from blacks. The sample, although large, was over-representative of certain types of women, i.e., fertile, married, northern-dwelling urban, and prone to have children in a hospital (which at this time only about a third of all mothers did). The sample women also tended to be better educated than average. These characteristics in general seem likely to predispose the sample to be more aware of the possibilities of family planning and perhaps more frank in discussing it. The circumstances under which the information was collected would seem to have been exceptionally favorable for the gathering of gynecological information, given the recent shared experience of the respondents and questioners. Pearl believed the data relating to black females to be of substantial accuracy (Pearl, 1936b: 272).

Pearl reported that 16.4 percent of the black women interviewed admitted to having used some contraceptive technique to prevent pregnancy. This proportion compares with 43 percent of white women in the sample. The black women declaring that they had done nothing to limit their fertility comprised 83 percent. The statements of the remainder, 0.6 percent, were disbelieved for some reason. To determine how effectively the women used the techniques they claimed, two groups were identified, the first consisting of women married once only and living with their husbands, who had never used birth control and had no detectable gynecological disability, the second comprising those in the same situation, but who had practiced contraception "regularly and steadily without intermission . . ." throughout their marriages (Pearl, 1936a: 505). Among the black women the differences in fertility between those who practiced birth limitation and those who did not were not measurable. Pearl concluded that "the general run of Negroes do not practice contraception effectively" (Pearl, 1936a: 505). Pearl's sample was not from "the general run of Negroes," who were much more southern and rural than his group. But had such a survey been taken of a truly representative group, it is likely that their problems with infecundity would have been greater and their propensity to contracept even less.

Another study, involving a maternal health clinic in Spartanburg County, South Carolina, although based on a much smaller sample than Pearl's study, is of particular interest because it involved both rural and urban blacks from a cotton-growing county within the six-

state region we are considering (Stix, 1941a and 1941b). The purpose of the study was to compare the effectiveness of the services of three maternal health clinics, of which Spartanburg was one. The others, in New York City and Cincinnati, served white communities. Nearly half of the Spartanburg clinic's clientele were blacks (457 compared with 530 whites), and the data for them were tabulated separately. Stix presented the data applying to black fertility and family planning incidentally rather than as the main topic of her paper.

The Spartanburg patients, both white and black, were generally of low economic and educational status. They tended to marry early (at age 18.2 on average for blacks) but to have low fertility relative to the period at risk of pregnancy. Stix related this finding directly to the prevalence, among both whites and blacks, but more particularly the latter, of "pelvic or endocrine pathology or pellagra or syphilis" (Stix, 1941a: 179). Of the Spartanburg black patients, 31 percent tested out as having syphilis. The effect of the disease was seen in 16 percent of their pregnancies being terminated by spontaneous abortions or stillbirths. In contrast to the whites at all three clinics, the blacks had a negligible incidence of induced (illegal) abortion, only four cases being noted in the study.

The results of the survey applicable here were:

- Only 15 percent of the blacks attending the Spartanburg Clinic had previously attempted contraception. By contrast the proportion for whites was 38 percent. In the New York and Cincinnati clinics the white proportions were 90 percent and 73 percent respectively.
- When black women used the prescribed contraceptive (almost always a diaphragm and spermicidal jelly), as instructed by the clinic, the proportion of pregnancies avoided was 80 percent, a proportion virtually identical to that of the white women of Spartanburg and also to the "welfare recipient group" at the Cincinnati clinic. This proportion would have been much higher for both Spartanburg groups had they been more dextrous in the use of the method in the first three months, when the level of accidental pregnancy was over ten times as high as it became later.
- The most frequent reasons given for abandoning the prescribed contraceptive among blacks was that it was "too much trouble to use," whereas among the white patients the most frequently cited reason was discomfort. Blacks also recorded "difficulty in placement" much more frequently than whites.

- After visiting the clinic, blacks had the highest levels of continuing to use no contraception at all (11.7 percent) and discontinuing contraception after using the clinically prescribed device (27.2 percent).
- After attending the Spartanburg clinic, black women whose preclinic contraceptive practice had had little effect on their fertility showed a dramatic increase in the effectiveness of their contraceptive practices (179 percent overall). Even if the prescribed contraception is discounted, their effectiveness nearly doubled.
- When black couples abandoned the contraception technique prescribed by the clinic, they showed an overwhelming preference for a return to the douche. As used by these women, this method averted about 60 percent of the pregnancies that would have occurred had no contraception been used. The condom, which was a popular alternative to the clinically prescribed method among whites attending the clinics, was not favored by blacks, who usually cited cost as the discouraging reason.

Overall, one does not get an impression from the Stix study of a black population previously accustomed to or at ease with family planning techniques.

The third study, by Beebe in 1939, involved 155 black women (along with 380 whites) who were married to coal miners in Logan County, West Virginia (Beebe, 1941). The survey involved a much smaller and more restricted sample than the other two and the area studied is outside the six-state region. It is nevertheless of some interest, as the purpose of the report was "to demonstrate the irrelevance of contraception" in explaining why the fertility of white women exceeded that of the black women by more than 50 percent (p. 190).

Only 7 percent of the black women reported any contraceptive practice, compared with 33 percent of the whites. These black users, although small in number, had much higher fertility than those not practicing birth control. Black women who did not practice birth control because they wished to become pregnant had the lowest observed fertility of any group (p. 193). Beebe concluded that although many of the blacks surveyed were childless, not all of the low fertility for blacks as a group could be explained by this factor. Contraception played an insignificant part; and this left only two other possibilities, impaired fecundity and pregnancy wastage—i.e., abortion or stillbirth. Beebe noted that, among the women who accepted family planning,

"voluntary pregnancy wastage" did not contribute significantly to their low fertility. He therefore implied that involuntary sterility, which is often gonorrhea-related, and involuntary abortion or stillbirth, often syphilis-related, were the major factors (p. 195).

It has been necessary to review these surveys in some detail, both in their organizational setting and in the results yielded, because of their collective dismissal as "virtually worthless" in the recent study by McFalls and Masnick (1981: 99). McFalls and Masnick assert (p. 99): "Early studies of birth control use among blacks grossly underestimated its prevalence for a variety of reasons, the most important of which was the reluctance and refusal of blacks to admit to the practices."

They cite various reasons for this reluctance. One is that blacks in the 1930s thought that discussion of contraception was too coarse for polite conversation in American society of their day. This reason would seem to be irrelevant to the studies discussed here, since the black women interviewed were talking under survey conditions to doctors or clinical personnel rather than making polite conversation. Another is that blacks felt constrained because contraception was frequently restricted or "outlawed" in the United States. A third is that blacks would refuse to cooperate with white interviewers because of bad race relations. McFalls and Masnick also suggest that some blacks were practicing birth control without their spouses' knowledge and would not have wanted to admit this, and that others were practicing birth control in ways they did not recognize as such (abstinence, douching, or male withdrawal). Having cited all these reasons, they comment, "Indeed, one wonders that any blacks admitted it at all!" (p. 96). That many black women did tell of their contraceptive practices, even under these conditions, suggests that the constraints were not perhaps as powerful as McFalls and Masnick suggest. Had contraception been as common as they contend, it would have been so widely acknowledged that for black women who used it prevarication would have served no purpose.

In their presentation of contrary evidence, McFalls and Masnick rely on two surveys. The first, reported in 1976 but conducted in 1966–68, was by Immerwahr, who interviewed in Baltimore 50 lower-middle-class black women in their fifties and sixties, an unspecified number of black males, and "several black sociologists" (Immerwahr, 1976: 6). The other, which they recently conducted themselves in

Philadelphia, included among its subjects 279 black women in the 55–59 age group—that is, those whose childbearing began in the low-fertility period of the 1930s Depression (McFalls and Masnick, 1981).

Both these surveys had small numbers of informants, who were northern and urban. The studies focused on the last decade of the fertility decline and, worse, were retrospective. Were we forced to choose between the two groups of surveys on the basis of which provided the most reliable information on the prevalence of contraception among all blacks from Emancipation to World War II, we would have to select the three done in the 1930s, despite their deficiencies. To coax women in the contracepting society of the 1970s to recall their birth control practices four decades before seems to be inviting misinformation.

The surveys of the 1930s did find that blacks knew of, approved of, and practiced family planning, but to an extent that varied considerably by location and class. Blacks outside the South, nearly 90 percent of whom were urban-dwelling in the 1930s, appear to have practiced conscious family planning on an appreciable scale. Pearl (1937: 1387), surveying black women in Chicago, found that 47 percent overcame their scruples and admitted using contraception. Among urban blacks outside the South, it has been established that fertility levels were low and changed only slightly during the 1900–40 period (Farley, 1970: 105). In the 1930s, however, 80 percent of blacks still lived in the South and there remained predominantly rural and poor. Among them, contraceptive use appears to have been negligible. The evidence for this inference is admittedly not strong, but in the absence of positive evidence related to innovation of this kind, it is reasonable to assume that the diffusion of family planning was still in its early stages.

A study by Tolnay (1981), which contrasted urban and rural black fertility in the closing years of the 19th century (1886–99), using data derived from the 1900 census, found that the age pattern of urban black marital fertility strongly indicated deliberate family limitation, perhaps as early as 1880 but certainly before the end of the century. By the 1893–99 period the total marital fertility rate (TMFR) of urban blacks was down to 3.5 births. In contrast, rural blacks, constituting then about 80 percent of the black population, were found to have a much higher and essentially "natural" TMFR of 7.7 births. Tolnay concluded that the amount of deliberate fertility control among them, estimated by the method developed by Coale

and Trussell (1974), was minimal overall but had some interesting variation by age. A fertility reduction of 28.5 percent between the periods 1886–92 and 1893–99 for the 25–29 age group and a 20.1 percent reduction for the 30–34 age group was implied, while the 45–49 year olds were seen as having increased their fertility by 7.7 percent. This pattern is at odds with the observations made of other populations in the earliest phases of fertility decline, wherein the greatest declines occur at later ages among married women as they attempt to contain their childbearing within the lowered range of desired family size (Tolnay, 1981: 456).

Although the point is not made by Tolnay, who observed that the declines could be "partially artifactual" and that the causes were "difficult to specify" (p. 456), the pattern he derives, applying to the earliest stages of a fertility decline, is entirely consistent with that expected in a population in which involuntary subfecundity, associated with sexually transmitted diseases, is beginning to be a force.

The finding of a marked contrast between the urban and rural blacks in their fertility behavior is of importance to the argument over the role of deliberate contraception during the first black fertility decline. Tolnay observed that "the dynamics of reproduction were extremely different for rural and urban blacks" (p. 459) and that for rural blacks the decline from a high, "natural" fertility level did not begin until after about 1896. By this time urban blacks had achieved a considerable reduction in their fertility due at least partly to the use of deliberate family limitation. This explains why McFalls and Masnick (1981) are able to find evidence of contraceptive use in the 1930s among their urban northeastern black groups. But it throws into doubt their contention that contraception was characteristic of all blacks, most of whom at that time were still predominantly rural and southern.

To be convincing, McFalls and Masnick's contention, that the black fertility decline in the United States was related in a major way to the progressively increasing adoption of deliberate contraception during the period of 1880–1940, would have to show that rural, poor, southern blacks were consistently and effectively practicing contraception on a massive scale and why, contrary to well-developed demographic theory, they were doing so. A development of the magnitude necessary to have accomplished the observed fertility decline could scarcely have escaped contemporary observation and would have been likely to

find its way into the scientific literature. The paper by McFalls and Masnick contains no evidence, however, that such a development occurred. Their contention, for example, that the 1910 child-woman ratio (CWR) of about 500 among blacks was associated with 35–40 percent birth control use (McFalls and Masnick, 1981: 89, fig. 1) is entirely unsupported. The CWR of blacks living in the northeastern states, about 270 in 1910, was so low that it was probably substantially affected by deliberate contraception, but the effect of this group's fertility on U.S. black fertility as a whole would have been small (see Farley, 1970: 105, table 5-1).

There have been other cases of a culturally separate component within a larger population persisting in its resistance to family planning decades after the majority group completed its transition to fertility control. It happened among the New Zealand Maori, whose fertility characteristics resembled those of their fellow Polynesians in the tropical South Pacific islands rather than those of their modernized neighbors at home—until the 1960s, when they too began a fertility decline related largely to family planning (Borrie, 1959; Pool, 1977).

Social research among rural blacks of the South in the 1930s, by Johnson (1934 and 1941a) and Powdermaker (1939) for instance, substantiated the view that children were strongly desired and that large families were an advantage.

> The large numbers of births would not necessarily prove that the Negroes of the community [a county in the Yazoo River valley, Mississippi] as a rule really want children; but the actions and attitudes of adults toward children, and what most of them have to say on the subject, put it beyond question that they do. . . . children are an economic asset. There is no ban on child labor here, and children are counted as hands or half-hands in the cotton fields. . . .
>
> Children are also considered a form of old-age insurance (Powdermaker, 1939: 199).

And,

> In a system which requires the labor of the entire family to earn a living, children of a certain age are regarded as an economic asset. They come fast, and there is little conscious birth control. The coming of children is "the Lord's will." The number of miscarriages and stillbirths is extraordinarily high and the infant mortality great. There is pride in large families. "Good breeders" are regarded with admiration. . . . For men the size of the family is a test of virility and for women fecundity has tremendous weight in their valuation as mates (Johnson, 1934: 57–58).

Adoption was easy, informal, and frequent, children being welcomed particularly by childless couples but even by families already large (Johnson, 1934: 64).

Neither Johnson nor Powdermaker referred to "family planning" or "birth control" as an important element in rural black culture in the 1930s, although both mentioned contraception briefly. Johnson: "Although contraceptive devices [presumably, in this context, the condom] are frequently used by rural Negro youth, the rates for syphilis and other venereal diseases are high" (1941a: 234). Powdermaker, referring to the work of the recently established county Health Department clinics: ". . . the gradual dissemination of information concerning birth control is likely to reduce the birth rate to some extent" (1939: 199).

The picture emerging from all these studies, which were based on systematic surveys, is of a largely rural population, essentially pretransitional in its fertility preferences, welcoming and being interested in children for reasons characteristic of peasant societies. In addition, most blacks in these surveys seemed to show little embarrassment about children born outside marriage, although this varied rather sharply with class. They were largely oblivious of the utility of systematic contraception or deliberate abortion and apparently saw no need for such intervention, although aware of the possibility. By contrast, the prevalence of venereal diseases, miscarriages, stillbirths, and childlessness is referred to frequently and in some detail in these studies.

The economic plight of most blacks in the southern states is shown as so bad that lack of money would preclude their adoption of any of the more efficient family planning methods then available. We have already mentioned that the prohibitive cost of the condom, for instance, reduced its use by most blacks. Not until the states, using recently available federal funds, began setting up maternal health clinics that dispensed family planning advice and supplies in the 1930s did the situation begin to change. Even then, the assistance was part of a general movement to improve the health status of blacks, for whom assistance of any kind had been previously entirely inadequate. In other words, family planning, in a systematic fashion, was not a part of the lifestyle of the great majority of blacks in the southern states until it was offered as part of a larger package including assistance in combating the problems of pellagra, malaria, tuberculosis, typhoid, venereal diseases, and the other "miseries" which, after Emancipation, the southern black had to endure almost unaided.

VENEREAL DISEASE: THE PATH OF CUMULATIVE INCREASE

There is considerable evidence, of a soft or inferential kind, to suggest that neither syphilis nor gonorrhea was common among blacks during the period of slavery. From 15 works examined alluding to the health conditions of slaves in the United States, we discovered only two that even mentioned venereal diseases. According to Stampp (1956: 303), "syphilis, contracted from the whites, was present in the towns and on scattered plantations but it did not spread rapidly." Flanders (1933: 168) stated that "venereal diseases were not unknown among the slaves." He cited a few examples and reported one county record indicating one slave death (out of 53 reported) had been caused by syphilis (p. 173).

In a fairly detailed description of slave health and alleged lax moral standards, Weatherford (1924: 276) omitted mention of either venereal syphilis or gonorrhea, although he did assert that "there was considerable prevalence of disease on account of sex indulgence—not withstanding popular opinion to the contrary." He then confused the issue by identifying the diseases as "yaws" and "scrofula." Yaws would have been prevalent among blacks in the African humid tropics and in the areas of Central and South America, including the Caribbean islands, with similar climates. The six-state region was not climatically suitable for yaws, however, and over time this infectious but nonvenereal disease would have died out. Yaws confers a substantial immunity to venereal syphilis and could have been a factor in the low incidence observed among slaves, but only among those transported from the humid tropics.

Medical records reflecting the relative incidence of venereal disease at the time of Emancipation are available from the records of the Union Army (1863–66). They show generally low levels among black servicemen: 34 per thousand annually for syphilis and 44 per thousand for gonorrhea. Venereal diseases among white troops were about double these rates (U.S. Surgeon General, 1888: 891). Reviewing the evidence, we tend to agree with Plaut (1927: 2), who asserted that the "general opinion is that Negroes did not suffer from . . . syphilis extensively before their liberation and the occurrence of insanity among them is considered rare."

Although many U.S. historians, writing about living conditions under slavery, faithfully preserve the tone of abolitionist literature, their views have been challenged by some modern historians (e.g.,

Fogel and Engerman, 1974). Slaves were a major capital investment under the plantation system, and in most cases health and natural replacement were promoted for economic reasons if for no other. However, living conditions and the degree of mobility for most slaves were under the complete control of the owners. A stable, family-based paternalistic situation conducive to high fertility, compatible with the levels observed, would seem to have promoted a more stable work force and therefore higher profits to the slave owner. Certainly, the expectation of life for blacks was short (about 34 years) during the heyday of slavery before 1860, but that of whites was not much longer (about 39 years). To be deprived of the health care available in the first half of the 19th century was not to be put at much of a disadvantage.

Incidence of venereal disease after Emancipation

After the Civil War living conditions for most blacks deteriorated, becoming more conducive to the spread of venereal diseases. Unless free blacks were able to acquire land of their own or find stable employment—and only a small minority could—their lot was usually sharecropping, tenant farming, and rural wage laboring. Conditions of employment began as little better than those prevalent under slavery, and there is evidence that they deteriorated rather than improved with time. Blacks' freedom became the option to move about in attempts to find something better. Poverty, illiteracy, cultural deprivation, marital instability, anonymity, and mobility are usually associated with a high incidence of venereal disease, and they were increasingly characteristic of the black population after Emancipation (Frazier, 1939).

Evidence showing the path of cumulative increase of venereal disease after 1865 is rather scanty. Some observers began noting an upsurge in the numbers of blacks in mental institutions late in the 19th century who suffered from syphilitic paresis.

> The general opinion is that negroes did not suffer from tuberculosis and syphilis extensively before their liberation, and the occurrence of insanity among them is considered rare. Figures are given by Miller, in 1896 [no reference], to substantiate this. He said that in the State of Georgia there were 44 negroes (1:10,584) in the insane asylums in 1860. In 1870 there were 129 (1:4,225), reaching 910 (1:943) in 1890. For the entire United States insane asylum inmates among the negroes amounted to 638 in 1850,

> and to 6,766 in 1890. Insanity, according to these statistics, increased almost 500 per cent among the colored population, while it doubled among the white, between 1860 and 1880. These figures must be taken with some reserve as care for the colored insane set in about this period, while it had existed for the white insane for a considerable period previous to that (Plaut, 1927: 2).

Spontaneous abortions related to syphilis were observed by DeSausser as being "frequent" in South Carolina by 1894 (quoted by Holmes, 1937: 28). Until the results of World War I military examinations were made public, no reasonable estimate could be made of the incidence of venereal diseases among blacks.

Evidence from examinations made during World War I

All men inducted into military services in World War I were examined for venereal disease; but serologic tests for syphilis, though known since 1907, were not given nor were clinical histories taken (U.S. War Department, 1920). The data published were not analyzed by race. Among the second million recruits examined, the presence of two "major defects" was used as the basis for rejection. The data indicate that, overall, 1.0 percent of those examined showed syphilis and 4.5 percent had gonorrhea. The method of examination for syphilis, mainly inspection, would tend to give results very different from the indications of the serologic testing employed during World War II. Only men currently in the first or second stages (those with infections of less than two years' duration) would likely have been identified. Even given the relatively youthful age range of the recruits, many latent cases would have been overlooked. The method used for diagnosing syphilis during World War I resembled that used for gonorrhea. Thus, observed rates of the two diseases were more comparable than they were during World War II, except that, given the longer duration of active syphilis, any one case would be at least three times more likely to be detected in a mass one-time examination than any one case of gonorrhea. Several observed problems, classified as "major defects," were given priority over venereal disease; and these varied with the draft boards concerned, so that the number of infections discovered would be higher than the number given in the reports, although we cannot say by how much.

The six states with the highest reported rates of venereal disease were those of our study area—that is, the states with the highest

TABLE 2. Reported rates of venereal disease among the "second million" U.S. servicemen examined in World War I
(Rate per thousand examined)

State	% black (1920)	Syphilis	Gonorrhea	All venereal diseases
Florida	34.0	22.4	134.2	163.3
Georgia	41.7	28.9	101.7	135.6
Mississippi	52.2	22.2	106.6	132.4
South Carolina	51.4	16.5	109.9	131.3
Louisiana	38.7	33.1	85.7	121.1
Alabama	38.4	37.9	73.5	114.7
All United States	9.9	10.5	44.7	56.7

NOTE: Although military records refer to two million servicemen, in fact 1.8 million were examined.

SOURCE: United States War Department (1920: 104–5).

proportions of blacks (Table 2). The data do not indicate what proportion of the venereal disease observed was associated with the blacks examined, but admissions of all U.S. servicemen for treatment of venereal disease in the 1917–19 period showed that blacks had a five-to-one ratio over whites (Table 3).

Although venereal disease and military life are notoriously associated, within the United States it is probably reasonable to assume that each group acquired most of its infections from within its own community. Thus the relative, though not necessarily absolute, incidence of the disease among military personnel should be a fair indication of levels in the respective civilian populations. Rates among black servicemen of over 400 cases per thousand annually for gonorrhea and over 100 cases per thousand annually for syphilis must have dismayed the military authorities of the time. Syphilis levels were three times those observed in the Civil War and the gonorrhea level approached ten times the Civil War level.

Although few men diagnosed as having syphilis were rejected from military service in World War I, military authorities had a policy of sending only troops free of the disease to Europe. Therefore, most of the cases hospitalized there would have been locally acquired and, again by policy, severe. Black servicemen were subjected to special precautions against syphilis. On returning to their bases, they had to

TABLE 3. Annual admissions for treatment of venereal disease among U.S. servicemen stationed in the United States, in Europe, and all locations, by race: 1917–19

U.S. servicemen by location of assignment and race	Annual admissions per 1,000		
	Gonorrhea	Syphilis	All venereal diseases
United States			
White	75.9	17.7	101.1
Black	424.5	111.1	589.5
Ratio: black to white	5.6:1	6.3:1	5.8:1
Europe			
White	15.9	5.9	27.9
Black	20.3	16.7	57.5
Ratio: black to white	1.3:1	2.8:1	2.1:1
All locations			
White	49.5	12.6	66.9
Black	232.0	65.0	331.6
Ratio: black to white	4.7:1	5.1:1	5.0:1

SOURCE: Mitchie (1928: 264, 272, 293).

submit to inspection and to intense scrubbing and disinfecting of their genitalia. Whether these primitive measures were effective, which seems unlikely, or whether this humiliating prospect made black soldiers less inclined to leave their bases, their rates of infection in Europe remained low (Siler, 1943: 103).

The change from the situation observed before and during the Civil War, when the venereal diseases presented little problem, to that observed in World War I, when the problems had become obviously considerable (though impossible to quantify precisely), indicates that over the 50-year period the incidence of both syphilis and gonorrhea among blacks had increased dramatically.

The interwar years

After World War I, increased serologic testing began to reveal the magnitude of the syphilis problem among blacks. For instance, between 1929 and 1932, the Rosenwald Foundation conducted serologic

tests on the entire black population in six southern counties. (For reports of the results of individual counties, see Hazen, 1947; Fellows and Perry, 1941; Wenger, 1929; Crabtree and Bishop, 1932.) The level of positive tests was approximately 19.5 percent overall, ranging from 35.0 percent in Macon County, Alabama, to 11.5 percent in Albemarle County, Virginia (Hazen, 1947: 7). It is noteworthy that the blacks in Macon County were mostly poor tenant farmers, whereas a high proportion of those in Albemarle County were relatively prosperous and residentially stable farm owners. Overall, the proportions of males and females who showed positive reactions were about equal, a situation also found in most other surveys. Among adults of reproductive age, the proportion showing positive reactions was much higher than these overall figures.

Serologic testing during World War II

Any doubts about the seriousness of the syphilis problem among blacks were dispelled by the results of serologic testing of the first 1.9 million men examined by the Selective Service during World War II. In this representative sample of young civilian males, some 1.7 percent of whites and 25.2 percent of blacks showed positive or doubtful reactions to the tests (Vonderlehr and Usilton, 1941a: 1371).[2] When standardized for the age distribution of the U.S. male population 21–35 years old, the adjusted rates are 2.2 percent and 27.2 percent respectively. Among blacks of ages 31–35, 36 percent showed positive or doubtful reactions.

Peak rates and the beginnings of control

The data do not allow a precise description of the growth of the venereal disease problem among blacks between the Civil War and World War II. However, those assembled here (only a fraction of the data available) indicate an upward trend to the very significant level suggested for syphilis by 1917–18, a continuing upward trend through-

2. Both positive or doubtful reactions were used by Vonderlehr and Usilton to determine the prevalence of syphilis, because a 1941 evaluation of the tests indicated that less than 0.3 percent of positive reactors were found in known nonsyphilitic blood samples, whereas 10 to 15 percent of known syphilitic blood samples gave negative results. The investigators believed the incidence rates would have been higher had an infallible test for syphilis been available (p. 1372).

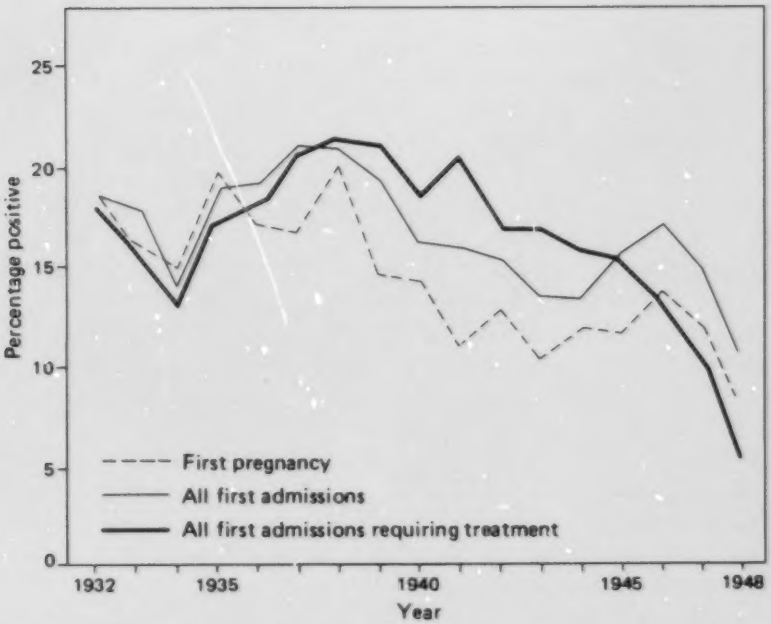
out the 1930s, and the dimensions of an epidemiological disaster when examined systematically, at last, in the early 1940s.

Although the data for gonorrhea are much less substantial, the pattern of this disease among blacks is assumed to be similar in form but, in number of individual infections contracted, somewhere between four times and eight times higher than that for syphilis. The incidence of gonorrhea among males and females is assumed to have been approximately equal, as it was for syphilis. By the late 1930s, at least 35 percent of blacks contracted syphilis before reaching the age of 35. If gonorrhea was four times more prevalent than syphilis, it is reasonable to assume that the number of gonorrhea infections suffered was at least 1,400 per thousand by the same age; but it could have been as high as 2,800 per thousand.

Some years prior to the entry of the United States into World War II, syphilis began to recede. The peak years seem to have been 1936–38. Given that decisive cures for both syphilis and gonorrhea were not available before the 1944 discovery that penicillin was effective against both diseases, this reduction requires some investigation. There is a considerable amount of evidence on the topic, but it tends to be fragmentary and often circumstantial.

In Mississippi, for instance, women attending six prenatal clinics showed a decline in positive syphilis reaction beginning in 1938 and continuing in a modest but unmistakable way until 1945–46, when the decline became dramatic. This response was probably due to the local introduction of antibiotics (Figure 2). Among Mississippi blacks, infant mortality from syphilis fell from a peak of 2.8 per thousand in 1936 to 1.0 in 1943 (Gray, Usilton, and Iskrant, 1950: 225). A marked drop in the proportion of positive reactions was noted among blacks taking premarital serologic tests in Chicago between 1937 and 1940 (Hazen, 1947: 13). Further evidence that the incidence of syphilis among blacks was declining before the introduction of antibiotics may be derived from the examinations of the Selective Service. Among the first million men examined in 1941, 1.8 percent of whites and 24.1 percent of blacks had positive serologic reactions. Between April 1942 and December 1943, 2.1 percent of whites and 21.5 percent of blacks had positive reactions. Usilton collected Selective Service serologic examination data and divided them into six periods of three months each covering January 1942 to June 1943. She noted a

FIGURE 2. Proportion of black women with syphilis or requiring treatment for syphilis at six prenatal clinics: Mississippi, 1932–48



SOURCE: Gray, Usilton, and Iskrant (1950:228–29).

clear downward trend in this period for both blacks and whites in all age groups in the South (Usilton, 1945: 266).

Two speeches made by Dr. Thomas Parran, then Surgeon General of the U.S. Public Health Service, and Dr. R. A. Vonderlehr, Deputy Surgeon General in charge of the Division of Venereal Diseases, U.S. Public Health Service, in February 1943 (Parran, 1943; Vonderlehr, 1943) provide an insight into the contemporary thinking of those in charge of the, by then, massive effort against venereal diseases. Parran's views are quoted here.

> It was only a few years ago that the nation finally began to realize that syphilis and gonorrhea are prime wasters of manpower, that they do

> enormous human damage, cost enormous sums. It is fortunate that we began to tackle this problem aggressively prior to the onset of war. The basic strategy of the campaign is simple: break the long chain of infections from one person to another. . . . Simple in concept, the execution of this strategy has been complicated. It has required the training of an army of skilled workers, the establishment and upgrading of laboratories, the securance of Federal, State and local money, the passage and enforcement of laws, the mobilization of community support, the organization of treatment centers and hospitals, and coordinated research to develop improved control methods (Parran, 1943: 141).

Some of the measures involved were the passage of the National Venereal Disease Control Act in 1938. From that year, the amount of money applied increased annually until 1943, when Parran announced that $25 million were being spent on VD control "in 3,000 communities in every state" (p. 142). From 1938 to the end of 1943, 1.54 million cases of syphilis and gonorrhea were admitted for treatment, "a large part of which were in the early and infectious stages which can be made noninfectious in a relatively short time" (p. 142).

Parran also referred to progress in treatments.

> Through recent advances in medical science, a quick and certain cure is assured for 80–90 percent of patients with gonorrhea. Several new short treatments for syphilis give great promise of success. One or more of them may supplant traditional methods (p. 142).

Vonderlehr went further and, referring presumably to the effect of penicillin on syphilis, declared:

> For gonorrhea we have the almost miraculous sulfa drugs, a new development which should permit us to eliminate that disease completely in a comparatively short time. For syphilis there are emerging from the experimental stage several new treatments which may mean the same thing for syphilis as the sulfa drugs mean for gonorrhea (1943: 203).

In 1942, 13.8 million sulfa tablets were given to gonorrhea patients. Other measures against venereal diseases included a vigorous campaign to close houses of prostitution. The May Act of 1941 put federal teeth into this movement, which was designed particularly to reduce the risk of acquiring venereal diseases in the vicinity of military bases and installations. Since 1939, however, the intentions of this act had been anticipated in most places by local authorities, and the May Act was invoked only rarely.

Parran, speaking in Atlanta, Georgia, also said, "We are deep in that

region of the nation where attack by venereal diseases has been most severe and where recent counterattacks have been most vigorous" (p. 143). He quoted figures for the state showing progress from 1939 through 1942. For example, the number of VD clinics had risen from 128 to 224, the number of syphilis patients treated per month had increased from 12,794 to 27,128, and the number of serologic tests administered annually had doubled (from 242,698 to 488,474). In 1942 the numbe of gonorrhea patients under treatment showed an increase of 241 percent over 1941. Parran singled out Florida for special mention as a neighboring state taking "great forward steps" and also mentioned "steady progress" in Louisiana, Mississippi, and Alabama.

From these accounts of progress, the impression of optimism and vigor, in contrast to previous alarm and dismay, is unmistakable. One of the themes struck by both Parran and Vonderlehr was that it was a patriotic duty of all citizens to help in the fight against venereal diseases since, because of their disabling effects, they impaired the war effort.

While it may be true, as McFalls suggests (1973: 9), that before 1944 no treatment was "completely satisfactory" for either gonorrhea or syphilis, in 1943 this was evidently not the opinion of two of the nation's most influential physicians. Whatever we may think of the sulfa drugs now in comparison with the extremely potent antibiotics of the present day, in the late 1930s and early 1940s they were considered "miracle" drugs that were particularly effective and widely used against gonorrhea. McFalls mentions their frequent use by the poor (particularly blacks), who obtained sulfa drugs directly from pharmacists and not by way of a physician's prescription. Hit-or-miss applications and toxic reactions aside, the widespread use of sulfa drugs in the late 1930s is the best explanation we have for the coterminous increase, slight though it was, in black fertility.

The ability of sulfa drugs to reduce or prevent the complications associated with gonorrhea must have been more effective than McFalls admits. And it is the complications that reduce fertility; the disease itself need not be cured. Gisslen, Hellgren, and Stark (1961: 370) found that, in Finland before the introduction of sulfanilomide, 14 percent of female gonorrhea patients developed salpingitis. With sulfanilomide treatment, the incidence was reduced to 2 percent. In males, the incidence of epididymitis dropped from 17 to 12 percent. It is likely that McFalls also underestimates the effect of preantibiotic

preventative activities against syphilis. The treatments given to syphilitics and the breaking of the "chain of infections" by social action must have had some effect.

In the areas surveyed by the Rosenwald Foundation, persons identified in the original surveys as having positive reactions were given treatment. In Albemarle County, Virginia, between 1931 and 1938, the rate for positive reactors dropped by 41.5 percent for males and 25.1 percent for females. In Pitt County, North Carolina, where 17 to 20 percent of all young black adults had positive reactions in 1930, premarital tests in 1939 indicated that the rate had been reduced by half. The black stillbirth rate in Glynn County, Georgia, dropped from 146 per thousand live births in 1930 to 65 per thousand in 1939 (Hazen, 1947: 10–11). Among blacks examined between October 1940 and April 1941 in Macon County, Alabama, the Selective Service found only 12.9 percent to be suffering from syphilis. In 1930 the level had been 35 percent.

After 1937, blood tests were required by some states for all marriage license applicants. By 1945 some 36 states had this requirement. In 1938, 3.5 million tests were given in the United States for syphilis; by 1942 the level had reached 20 million (Vonderlehr, 1943: 203). Between 1937 and 1942, 30 states passed laws requiring special prenatal care for syphilitic mothers. The incidence of congenital syphilis began to decline rapidly. The military authorities accepted draftees found to be syphilitic provided the men could respond to treatment then available.

After the introduction of antibiotics, treatment for several illnesses, including syphilis, probably had a serendipitous effect on gonorrhea as well. This effect was noted in the South Pacific, where gonorrhea receded dramatically after the populations were subjected to mass campaigns against yaws that included the use of antibiotics (Pirie, 1972: 199).

Some surprise and scepticism have been expressed that the results of control can be so suddenly reflected in rising fertility (e.g., McFalls, 1973: 12), but this effect may be further diagnostic evidence of gonorrhea. Since so much of the effect is concentrated in the early childbearing years, the sudden removal of the cause of infertility will just as swiftly and drastically improve the fertility of the group normally the most fecund. For instance, if the "normal" 20–24-year fertility rate observed among the Malays in 1957 is substituted for

the "depressed" rate of the blacks shown in Table 1, the TFR rises from 3.1 to 4.0 (29 percent) in five years.

In summary, there is good reason to believe that the decline in the incidence of venereal diseases among blacks became discernible in the late 1930s, and this decline in turn promptly affected their fertility. The TFR for blacks rose from a nadir of 2.7 in 1936 to 3.0 in 1945 and then rapidly to a peak of 4.7 in 1957. Thereafter, it began a decline, still continuing, which we attribute largely to deliberate family limitation, a movement toward the completion of the genuine demographic transition of the U.S. black population.

GEOGRAPHIC PATTERNS OF VENEREAL DISEASE AND BLACK FERTILITY

Although the circumstantial and historical evidence on the venereal diseases assembled so far makes a compelling case for the likelihood of a strong effect on the fertility of U.S. blacks, it is possible to make a stronger link between the two by using geographical techniques. Here we utilize the theory that, if areal variations in fertility and the incidence of venereal diseases are correlated within the six-state region shown in Figures 3 and 4, and if these two variables can be related to the distribution of particular economic or social factors, we shall have been able to establish a causal connection between them.

The possibility of making these connections directly is limited by available data to the year 1940. The likelihood of war in that year moved the U.S. Selective Service to examine medically a large number of young American males. Included in the examinations (totaling some 2.1 million up to August 31, 1941) was the serologic test for syphilis referred to previously. The results of these examinations have been published by the U.S. Public Health Service (1942 and 1943). The data are tabulated by age and race at the state level; unfortunately, the data were not published by race at the county level. From other sources, we were able to discover data tabulated by race at the county level, but only for Florida and Alabama. The time period is similar to, but not the same as, that for the state-level data (Gill, Smith, and Damon, 1943; Sonday, 1944).

Using these data as a basis for estimating the incidence of syphilis among blacks by county for the six selected states, we assumed that the relative incidence of white versus black syphilis rates at the state level would also apply at the county level, and that blacks in a given

FIGURE 3. Location of counties and urban areas discussed in text: six southeastern states of the study

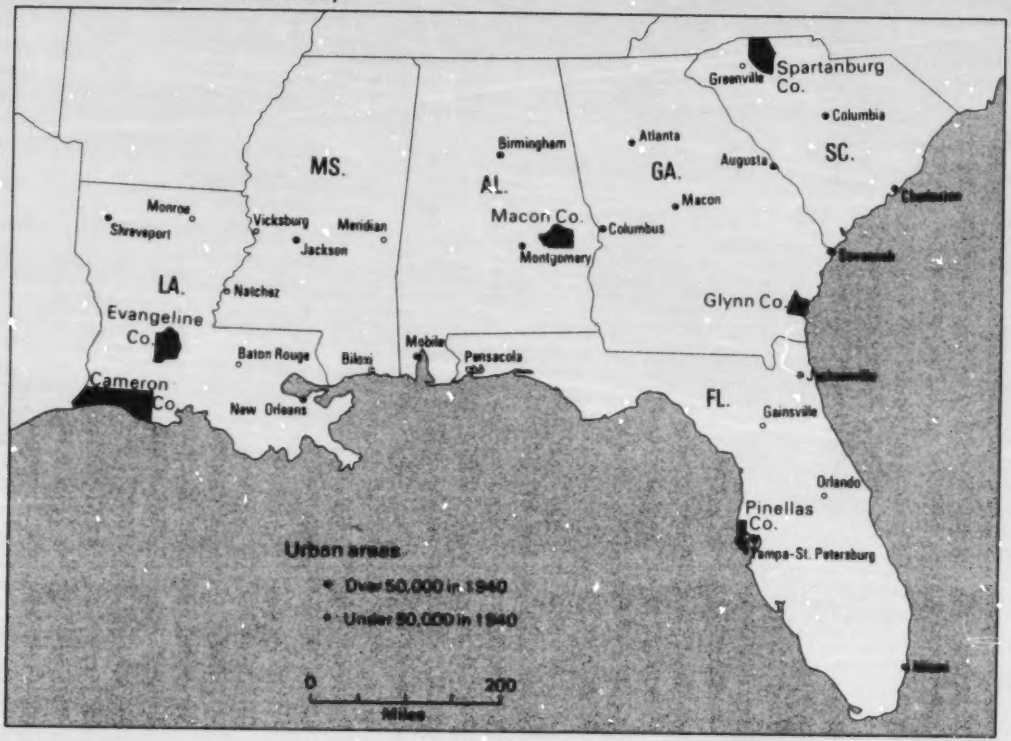
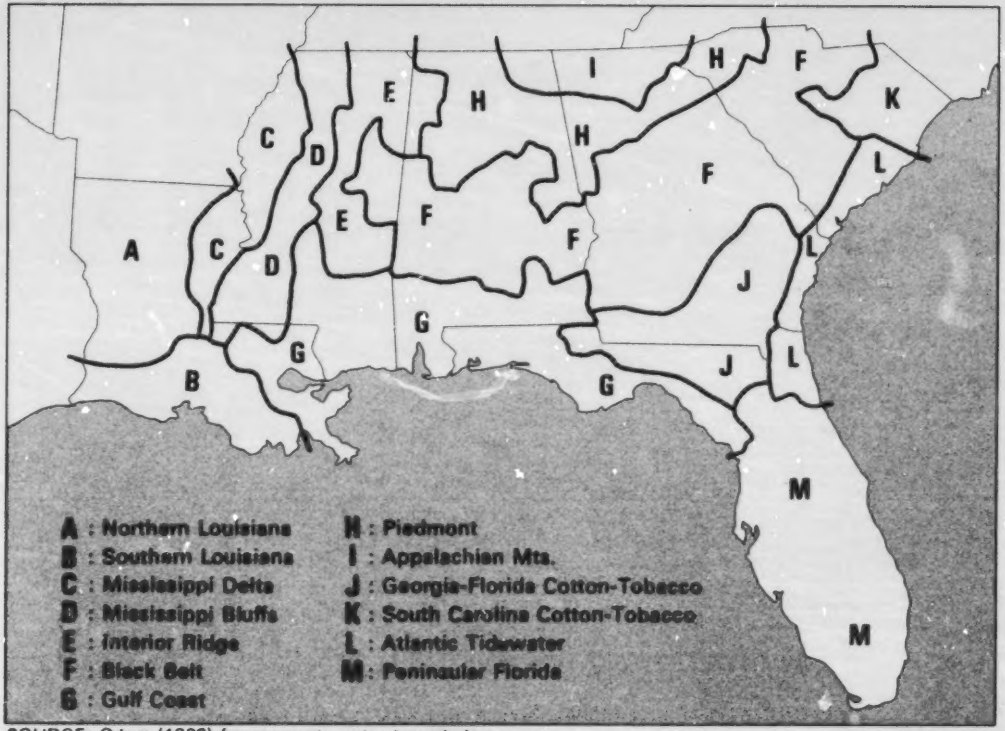


FIGURE 4. Location of economic regions within the six southeastern states



SOURCE: Odum (1936) for economic-region boundaries.

county were examined in proportion to their share of the population in the county. We were able to check on the probable accuracy of our estimates by comparing those derived using this method for Alabama and Florida with the true recorded rates for these two states. The correlations between the estimated and actual rates of syphilis among blacks at the county level were +.87 for Florida and +.89 for Aiabama. These correlations are sufficiently high to support the assumption that most of the estimated rates are close to the true figures. Gross errors are most likely in counties with low proportions of blacks or where only a few persons were tested. In some counties, fewer than 50 were examined. From these data we estimated the incidence of syphilis among blacks examined by the Selective Service during the period from November 1, 1940, through August 31, 1941 (Figure 5).

Several distribution characteristics are immediately apparent from this map:

1. Peninsular and panhandle Florida stand out as areas of very high incidence. Most of the counties exceed a 42 percent syphilis rate.

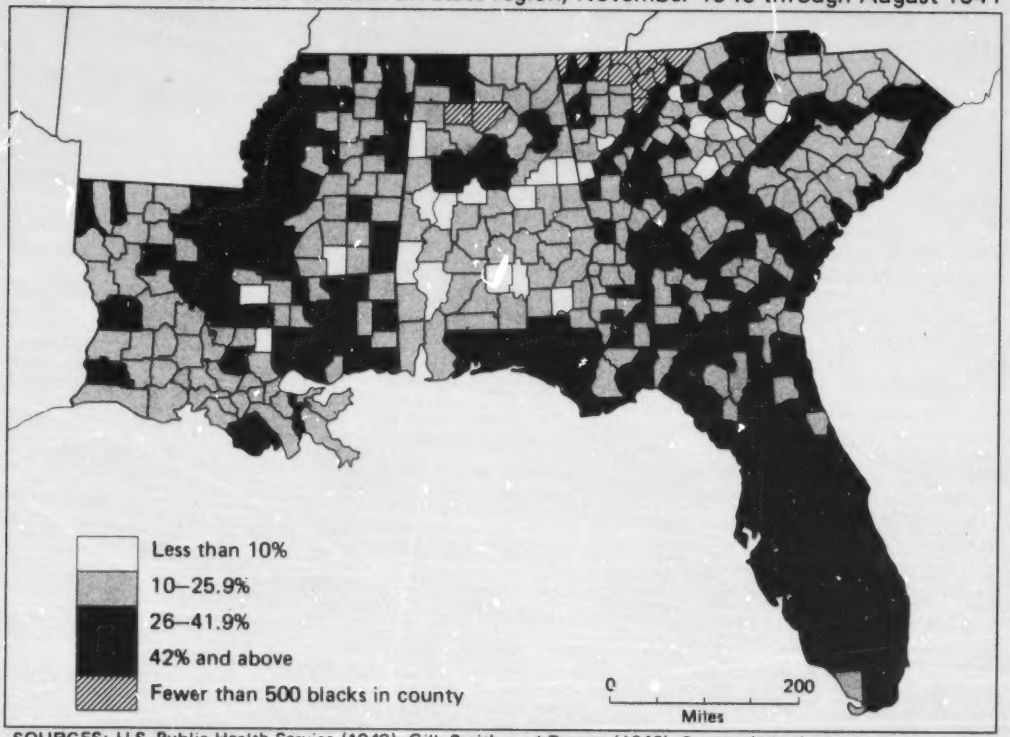
2. The Mississippi Valley Delta and Bluffs regions appear as areas with high incidence. Most of the counties show a rate in the range of 26–41.9 percent.

3. Counties containing or adjacent to the larger cities in the southern states (e.g., Atlanta, Georgia) frequently show higher rates than surrounding rural counties. (For locations of major cities, see Figure 3.)

4. Southern Alabama shows lower levels of syphilis than surrounding areas. Given the high levels indicated for this area in several small-scale studies, this finding is surprising. There is no reason to believe that the social and economic conditions prevalent in southern Alabama should have resulted in low rates of venereal infection. Possible explanations include a recession of the disease after extremely high levels in the recent past or a systematic bias in our data for this state. Given the local independence of draft boards, the latter explanation is more likely. We have found little evidence that Alabama was in the forefront of those states endeavoring to combat syphilis in the years prior to 1940, certainly not to the extent indicated here.

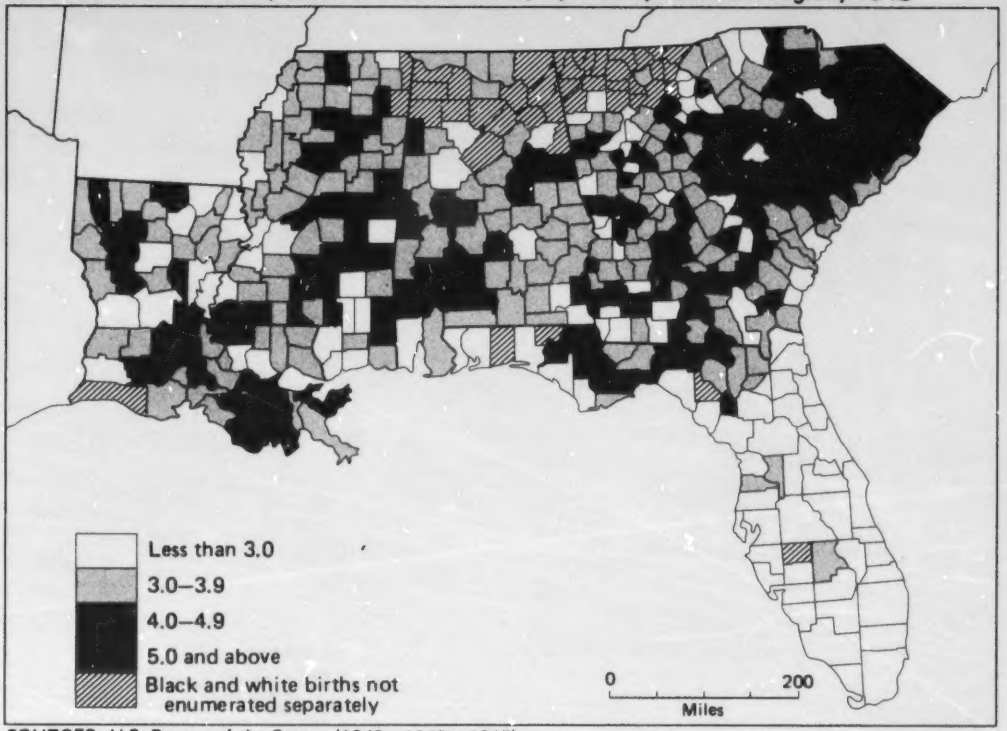
Using syphilis as a surrogate for other sexually transmitted diseases, We compared its distribution in 1940–41 (Figure 5) with the distribution of fertility. Figure 6 shows the estimated total fertility rates for black women in 1940 adjusted for underregistration of births. The

FIGURE 5. Estimated incidence of syphilis, by county, among black males examined by the Selective Service: six-state region, November 1940 through August 1941



SOURCES: U.S. Public Health Service (1942); Gill, Smith, and Damon (1943); Sonday (1944).

FIGURE 6. Total fertility rates of black women, by county: six-state region, 1940



SOURCES: U.S. Bureau of the Census (1943a, 1943b, 1945).

resemblance between the two distributions is striking. Peninsular and panhandle Florida stand out as areas of very low fertility, most counties showing a TFR of less than 3.0. The Delta and Bluffs areas of the Mississippi Valley emerge as having low fertility, virtually all counties having TFRs of less than 4.0 and many with less than 3.0. Counties containing larger urban areas stand out as areas of low fertility, most with TFRs of less than 3.0. In contrast, counties showing higher fertility, with TFRs of 5.0 or more, are concentrated in the "Black Belt" region and in Southern Louisiana and, without exception, are predominantly rural.

Although there is no shortage of anomalies, which appear when Figures 5 and 6 are compared county by county, these are to be expected given the uncertainty of our data and the arbitrary classes used in our mapping classification. Nevertheless, the resemblance between the two distributions is sufficiently great to suggest a strong relationship. For instance, of the 61 counties showing the highest syphilis incidence (42 percent and above) in Figure 5, 47 (or 77 percent) also appear in the lowest fertility class (TFR less than 3.0) in Figure 6.

Although in the six-state region the black population was predominantly rural, poor, and with little economic security in the late 1930s, there were internal variations that seem to bear on the distributions of fertility levels and of venereal-disease incidence just discussed. In Florida, the most affected, the lives of blacks were often very different from conditions found in the other states. Casual laboring, much of it itinerant, was characteristic of the economic opportunities available there to blacks. These jobs were related to the large commercial citrus and vegetable enterprises that were becoming the dominant form of agriculture. Almost two-thirds of the black males employed in agriculture were laborers; in many peninsular counties the proportion exceeded four-fifths. Nearly half of the black population in Florida was urban at this time, a much higher proportion than in the other five states. Although on the average probably better off monetarily than their rural counterparts, urban blacks at this time were subject to intense discrimination, persistently high levels of unemployment, and job insecurity aggravated by the Depression of the 1930s. The mixture of poverty, mobility, and anonymity characteristic of the blacks' lives in Florida, rural and urban, provide ideal conditions for venereal diseases to thrive; and we attribute major responsibility for the phenomenal levels of both the diseases and the consequent low fertility to these adverse social and economic conditions.

In the Mississippi Valley, in the region known as the Delta, conditions that may be related to the unusually high disease rates and low fertility were characteristic. More than two-thirds of the total population in this area was black, and the overwhelming majority of blacks (95 percent) lived on rural farms as tenants who stayed at one location for only short periods. According to Powdermaker (1939: 141), most sharecroppers in this region moved after only one year and a landlord was pleased if he could get the same tenant to stay for two years. Cotton growing was virtually the only agricultural activity, but, despite the productivity of the land, living standards were extremely low—the lowest of any region in the nation (Mangus, 1940: 22). The adjacent Mississippi Bluffs area showed similar characteristics, although the black proportion of the population was smaller (52 percent) and the proportion of black farm operators who were tenants was somewhat less (85 percent). The local economy was not quite so dependent upon cotton.

Many of the larger urban areas of the six states show up as having low fertility and a high incidence of venereal disease. In Florida, counties containing the major urban areas of Miami, Tampa, Pensacola, Jacksonville, and Orlando are examples. In this state, the rural counties are similarly affected so that the rural-urban contrast is not so marked. In other major cities in the South, the consequences of urban living on syphilis prevalence are more apparent. Examples include Atlanta, Savannah, Macon, Columbus, Augusta, and Gainesville in Georgia; Greenville (but not Columbia or Charleston) in South Carolina; Natchez, Biloxi, and Meridian in Mississippi (but Jackson and Vicksburg were not in the class of highest syphilis incidence). In Louisiana, Monroe appears as an extreme case; but New Orleans, Baton Rouge, and Shreveport all appear as having "high" rather than "very high" rates of syphilis. In Alabama, the urban areas of Birmingham, Montgomery, and Mobile appear to have had low fertility, but only industrial cities of the Piedmont, notably Birmingham, were reported to have high rates of syphilis. The low syphilis rate reported for Mobile, a large port city replete with U.S. Navy installations, is especially dubious.

On the whole, the living conditions for blacks were probably best in the rural counties of the Piedmont area. Slavery had been less common in this area, and blacks were not subjected to discrimination of the intensity found further south. Blacks constituted only about

one-sixth of the population, and about one-fifth of black farm operators were owners. In the adjacent Appalachian region, there were few blacks in most counties, too few to be considered for our analysis. Southern Louisiana, another area of relatively higher fertility and low venereal-disease incidence, provided living conditions for blacks rather different from elsewhere in the South. About a third of the population was black and the rate of tenancy quite high (about 70 percent), but many blacks worked on large sugar plantations or were engaged in growing rice. Living conditions were not good, partly because of the decline of the sugarcane industry; but this area was culturally distinct, being predominantly Roman Catholic and, in the case of whites, Arcadian. Mobility of the black farm tenants was severely limited by poor roads, marshy topography, and the lack of alternative opportunities.

Another area in which venereal disease seems to have had a relatively mild effect was the Interior Ridge region of Mississippi. Here, although most farms were small and economically marginal, the proportion of blacks who were owners was higher (about one-third) than in most other regions in the South and the proportion of blacks fairly low (about 20 percent). Although not well off, many black farm families in this region were included in small but stable communities. A similar situation existed in the tobacco-growing region of eastern South Carolina. Again, about one-third of the black farmers were owners, although their proportion of the total population was much higher than in the Interior Ridge in Mississippi.

This relatively hygienic situation extended into the northern part of the Atlantic Tidewater region, where along the South Carolina coastal strip black farm ownership was the highest in the six states. Unfortunately, this situation did not extend into the Georgia and Florida sections of the Atlantic Tidewater region, which showed much higher levels of disease and reduced fertility, particularly in the vicinity of the coastal ports.

Of the other regions of the South, the Black Belt, extending from Mississippi through central Alabama and Georgia into South Carolina, was overwhelmingly rural and about 60 percent black. Close to 90 percent of the black farm operators were tenants. In contrast to the prevailing situation in the Mississippi Delta, the average black tenant stayed at one farm for about six years (Woofter, 1936: 110). Living standards, although low, were not so insecure or erratic as in Peninsular

Florida or in the Delta region. The local economy was heavily dependent upon cotton. The pattern of syphilis occurrence was patchy, some counties recording less than 10 percent infection levels but most with levels in the 10–42 percent range, rising above it only rarely except in counties containing the larger urban areas. The distribution of fertility levels showed a similar pattern, mostly between the extremes, with a mean TFR of about 4.0.

Conditions along the Gulf Coast, a large region extending from the mouth of the Mississippi east into northwestern Florida, were varied. Cotton was not dominant as it was further north, and there was considerable development of fruit and vegetable growing. Settlement ranged from large ports, such as New Orleans and Mobile, to isolated fishing villages along the Louisiana coast and bustling seaside resorts in Florida. Blacks constituted only about 30 percent of the total population, and approximately 60 percent of those living on farms were tenants, a low proportion compared with the other regions. Overall, however, this benign influence on black health seems to have been counteracted by the relatively high level of urbanization and the nature of much of the paid employment available to blacks, for instance in the lumbering and fishing industries. Venereal disease rates tended to be high and fertility correspondingly low in most counties.

The only part of Florida consistently showing less than devastating syphilis levels and correspondingly low fertility was the cotton and tobacco growing region in the north, extending into southern Georgia. Even here conditions were poor, but the pattern was uneven. The cotton industry had been ruined by the boll-weevil infestation of the 1920s, and farmers had switched mainly to tobacco but also to peanuts. About a quarter of all black farm operators were owners, and blacks accounted for about one-third of the population. Many were employed in the lumbering, resin, and turpentine industries.

Somewhat parallel conditions existed in Northern Louisiana, except that cotton was still the major crop. The levels of black tenancy; the proportion of blacks in the population; the availability of nonfarm rural employment, mainly in forest industries; and blacks' fairly high but patchy levels of syphilis occurrence and apparent fertility impairment were similar.

VENEREAL DISEASE, FERTILITY, AND SOCIOECONOMIC CONDITIONS: 1940

The levels of venereal disease existing in 1940 must have approximated the worst case. Although syphilis began to recede in the country as a whole after 1937, by 1940 the improvement would scarcely have had a perceptible effect on its areal distribution or intensity in the South. Similarly, the distribution of TFRs in 1940 shows levels of fertility at or near their lowest for most counties. We have shown not only that these two distributions are related areally, but also that they are both in turn a reflection of the spatial variation in black living standards at the time. Where blacks lived predominantly in stable family situations, in small rural communities, preferably owning their own farms, or at least remaining at one location for long periods, even if in poor economic circumstances, their fertility was likely to be relatively high (TFR 4.0 or above) and their incidence of venereal disease correspondingly low. Where they lived in unstable conditions, subject to frequent mobility, separation of families, insecure tenancy or employment, jobs such as forestry or fishing that required the relative isolation of males (with the consequent fostering of prostitution), itinerant laboring, casual hiring in towns (and especially in cities, where individuals were even more anonymous) and frequent bouts of unemployment, venereal diseases became rampant and fecundity impaired. Although this relationship between the socioeconomic conditions of blacks has been traced here necessarily at only a general level, and more intensive research on these linkages remains to be done, the outline is clear enough for the purposes of the present paper.

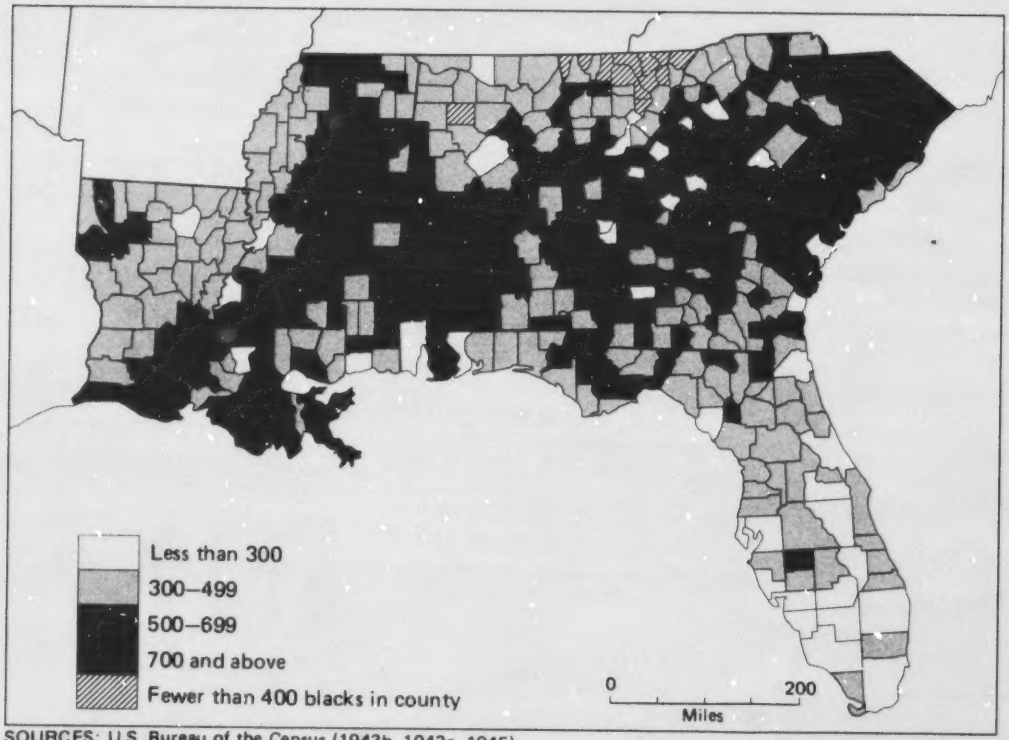
The accuracy and completeness of birth registration during the period under review left much to be desired. In the 1940 census, enumerators were asked to fill out a card on each infant four months old or less, and these cards were later matched with the registration-of-birth records. To the extent that cards could not be matched with birth records, births were considered to be underregistered. Estimated completeness of birth registration among blacks in the six states ranged from 71.7 percent in South Carolina to 86.4 percent in Florida (Grove, 1943: 2). In some counties estimates of completeness were very poor, as low as one-third. The lowest estimates occurred in counties with computed TFRs of more than 5.5, and we suspect that some

of those estimates were too conservative. In some counties, usually those containing fewer than 5,000 blacks, the accuracy of enumeration was estimated on the basis of fewer than 20 infants and so was subject to considerable random error.

As a check on the fertility distribution derived from the estimated TFRs, we computed the ratio of children 0–4 years old to females of ages 15–44, the child-woman ratio (CWR). Although theoretically the CWR, which is normally used as an index of population replacement, is inferior to the registration-based TFR as an index of fertility, we came to regard it as a more consistent indicator of black fertility variation in the South in this instance; the pattern of fertility for 1940 derived from the CWR data is shown in Figure 7. The CWR has the advantage of being available on a comparable basis for other census years after 1930, the first census for which age data on blacks by county were published. Furthermore, whereas the 1940 TFRs were derived on the basis of completeness, estimations derived from counts of infants under four months of age, the CWR is based on all children under five years of age. For small counties, therefore, the CWR is less subject to random error than the estimated TFR. All child-woman ratios used for individual counties in this study are indirectly standardized on the basis of the child-woman ratios of all U.S. black females in five-year age groups as reported in the census child-woman ratio reports.[3] The standardized CWR used as an index of fertility has limitations. For instance, the median age of the children enumerated in the census in the 0–4 age group is approximately, but normally

3. For the years 1930 and 1940, we standardized the CWRs on the basis of the number of children under five years of age per 1,000 black females in each age group from 15 to 44 as reported in the U.S. Bureau of the Census (1945: 12). We used the national age-specific ratios with the five-year age groups for a given county to compute what the CWR would have been if the age-specific ratios had been the national ones. We then divided this computed CWR for all women of ages 15–44 by the national rate to estimate the age-distribution effect of the potentially fertile women on fertility. The dividend was then multiplied by the unstandardized CWR to obtain the standardized CWR. To obtain the standardized 1960 CWRs, we followed the identical procedure except that we used the five-year age-specific CWRs for nonwhite women aged 15–49, as reported in the U.S. Bureau of the Census (1963: 1–485), for the standardization. In general, the standardized CWRs were higher than the unstandardized ones in rural counties, whereas the opposite was true in urban counties. These differentials reflect the migration of highly fertile young adults from rural to urban areas.

FIGURE 7. Child-woman ratios, by county, standardized on U.S. black population: six-state region, 1940



SOURCES: U.S. Bureau of the Census (1943b, 1943c, 1945).

less than, 2.5 years. To be counted, most children therefore must have survived the high risks of mortality in the year immediately following birth and the most dangerous months in the period defined as "toddler mortality" (1–4 years). The CWR is therefore affected by differential mortality in a way that fertility data derived from registered births should not be. It is also likely to be affected in this instance by differential undercounting of children under age five and of women in the reproductive age range. (Such differential undercounting also affects the estimated TFR.) Implicit in the measure, when it is used to estimate fertility, is the notion that children live with their mothers (or at least, in this case, stay in the same county). We assume in this study that errors arising from the estimation method are spatially random.

The difficulties posed by the inadequate fertility data notwithstanding, the correlation between the two data sets, the 1940 estimated total fertility rates and the child-woman ratios derived from the 1940 census, was +.82 for the counties of the six states. This is a moderately high score, providing some assurance that the overall patterns remain valid. For instance, Table 4 shows that both the TFRs and the CWRs correlate well with the broad groupings of estimated syphilis rates.

The data on which the TFRs are based, the age-specific fertility rates, are also of interest, as they illustrate the progressive effect of venereal diseases on fertility with increasing age. In Table 5 data from

TABLE 4. Average child-woman ratios and total fertility rates for blacks in counties with estimated syphilis rates ranging from less than 10 percent to over 50 percent: six-state region, 1940

Estimated syphilis rates among blacks (%)	No. of counties	Average CWR	Average TFR
< 10	24	609.6	4.206
10.0–19.9	106	571.2	4.158
20.0–29.9	155	523.8	3.825
30.0–39.9	96	446.9	3.412
40.0–49.9	32	370.9	2.676
50 >	30	300.2	2.280
All counties	443	496.9	3.648

SOURCE: All estimates our own.

TABLE 5. Age-specific birth rates (ASFRs), total fertility rates, and child-woman ratios for blacks in counties in which the estimated syphilis incidence was under 20 percent and over 40 percent: six-state region, 1940

Age group	ASFRs for counties with specified syphilis rates among blacks		Ratio 2 to 1 (%)
	20% (1)	40% (2)	
15–19	134.6	132.4	98.4
20–24	219.5	131.6	60.0
25–29	186.6	98.8	52.9
30–34	148.0	71.7	48.4
35–39	100.8	43.2	42.9
40–44	38.1	17.4	45.7
45–59	5.9	1.8	30.5
TFR	4.167	2.484	59.6
CWR	578.3	336.8	58.2

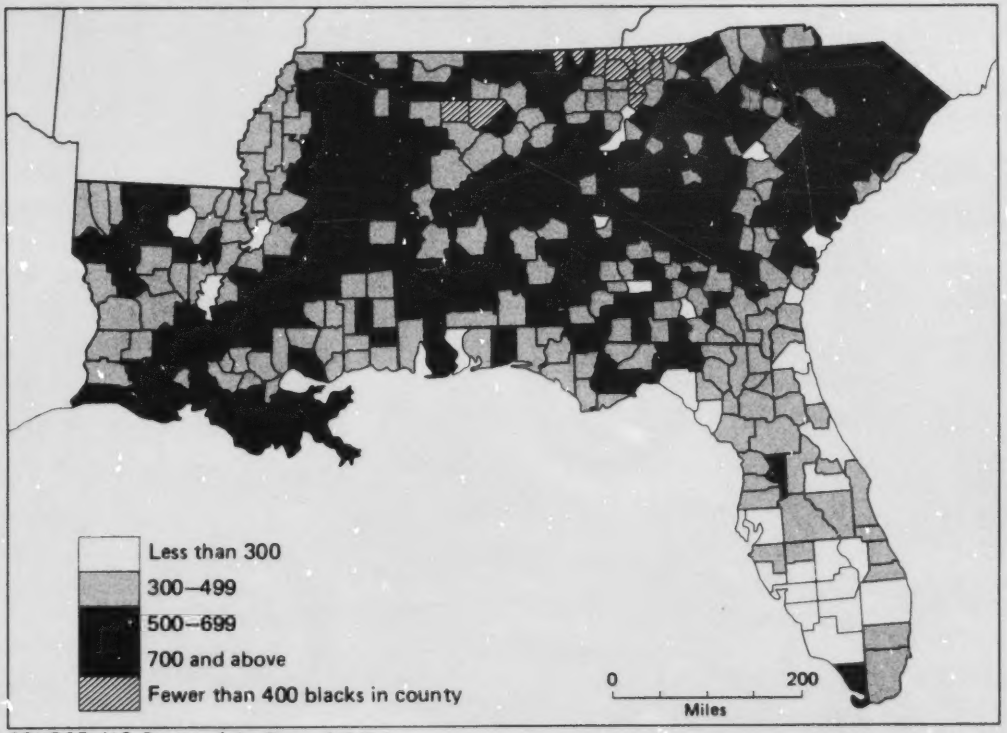
SOURCE: All estimates our own.

the counties showing extreme characteristics, less than 20 percent syphilis incidence and over 40 percent incidence, are used. For the youngest fertile age group, the birth rates are approximately equal in both cases, but in the counties with hyperendemic disease, the effect of the disease on fertility levels becomes more pronounced with higher age. The most rapid falloff occurs at ages under 30, reflecting the fact that both gonorrhea and syphilis are most likely to be first contracted in the teens or early 20s, and to have their greatest effect early in the reproductive years.

The pattern in 1930

The situation described above must have built up over a considerable period, but the possibility of analyzing past trends on a detailed areal basis is limited to the year 1930. The pattern of child-woman ratios for that year (Figure 8), compared with those of 1940 (Figure 7) shows a less extreme situation in that there are fewer counties in the lower fertility classes. For example, in 1930 there were 27 counties with a CWR of less than 300 per thousand, but by 1940 the number had risen to 34. The concentrations were similar, with areas of low

FIGURE 8. Child-woman ratios, by county, standardized on U.S. black population: six-state region, 1930



SOURCE: U.S. Bureau of the Census (1943c)

fertility again appearing in Peninsular Florida (one rural county had a CWR of only 140) and the Delta region of Mississippi and Louisiana, where most counties showed a 300–350 range. The Atlantic Tidewater region and the Gulf Coast also show up as having fairly low fertility.

Many of the counties containing the larger urban areas appear as having very low fertility. Atlanta, Savannah, Augusta, Jacksonville, Tampa, Pensacola, Vicksburg, and Monroe fall into this class, with CWRs of less than 300 in both 1930 and 1940. But several other urban areas show ratios in the 300–399 class in 1930; among these are Miami, Mobile, Birmingham, Biloxi, Natchez, and Baton Rouge. Most counties showed a higher CWR in 1930 than in 1940. Exceptions were several counties in the Mississippi Delta that registered increases of about 100 between 1930 and 1940, possibly related to pellagra control. Areas of relatively high fertility in 1940—eastern South Carolina, Southern Louisiana, and central and northern Mississippi—appear to have had even more noticeable high fertility in 1930.

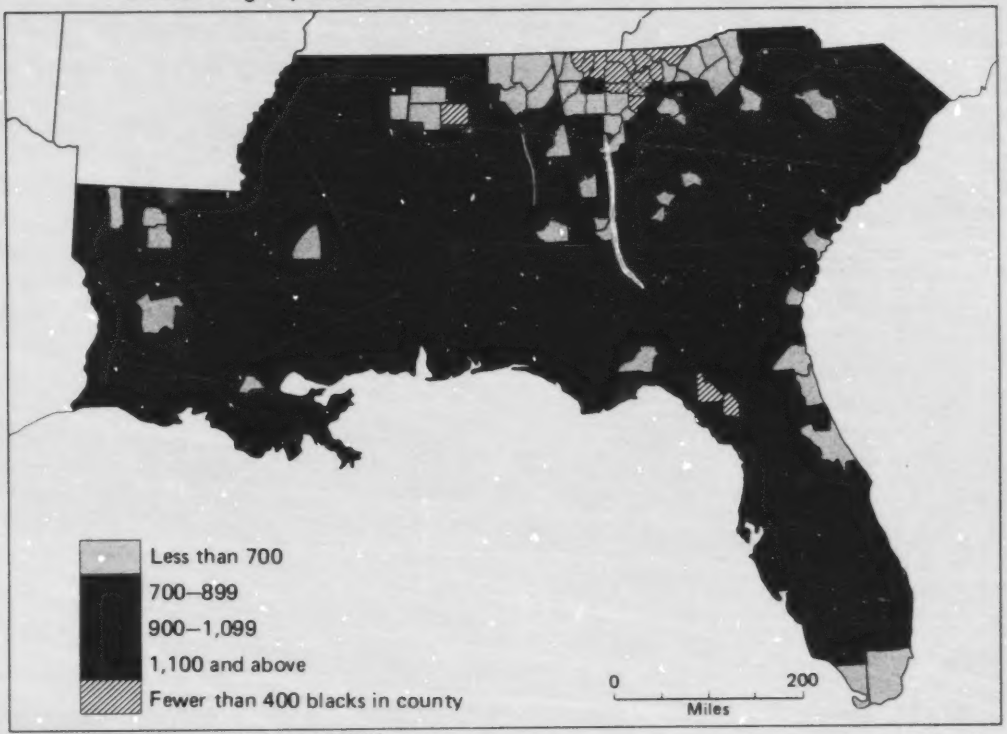
The 1930 and 1940 CWR distributions thus indicate a fertility decline among blacks throughout most of the region. The decline cannot have been the product of a recent development but must have grown out of a trend lasting at least several decades before 1930. Venereal disease would seem to be the primary cause of the trend.

The transformation of fertility levels: 1940–60

Use of child-woman ratios allows direct comparison to be made between the pre-World War II distributions and those of the postwar era. The distribution of CWRs for 1960 (Figure 9) reveals black fertility at its postwar maximum, providing a sharp contrast to the two prewar distributions. The transformation of black fertility in the years after the war is truly remarkable. In the six-state area as a whole the CWR increased by more than 60 percent between 1940 and 1960. When Figures 7 and 9 are compared, it is apparent that the CWR increased substantially in almost every county.

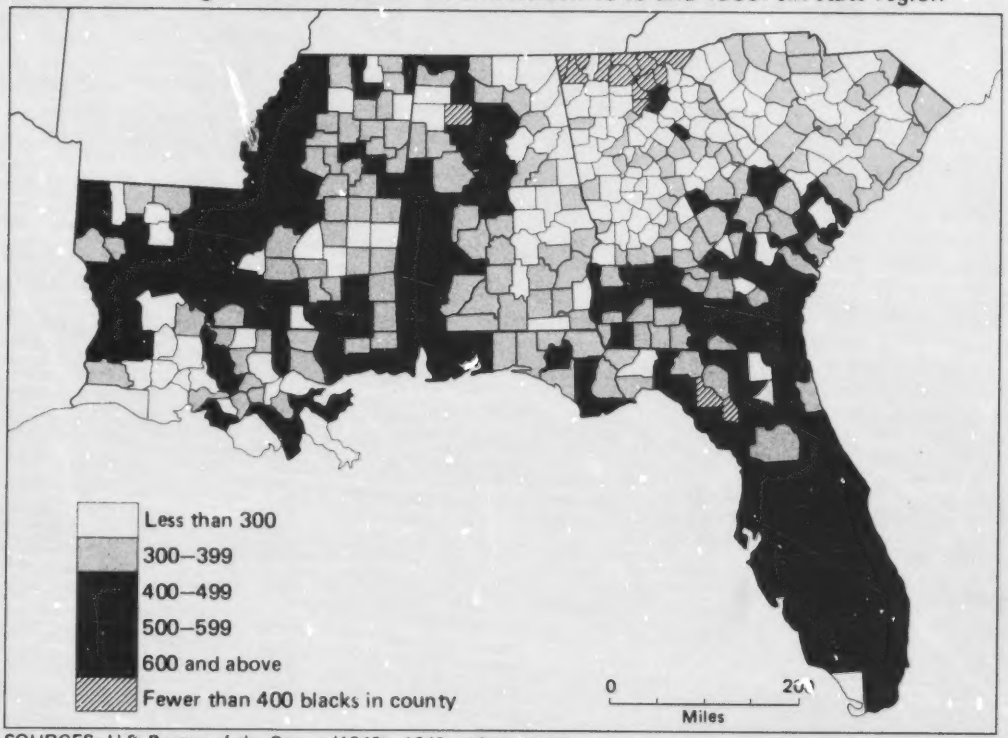
Figure 10 shows the magnitude of the changes. The Mississippi Delta region, the outstanding case, showed an increased CWR of more than 600 in almost every county. In several other areas increases were less but still substantial. In Peninsular Florida increased CWRs varied between 400 and 650, in southwestern Alabama increases were 400 to 500, while in the counties containing urban areas of more than

FIGURE 9. Child-woman ratios, by county, standardized on U.S. black population: six-state region, 1960



SOURCE: U.S. Bureau of the Census (1963).

FIGURE 10. Changes in child-woman ratios between 1940 and 1960: six-state region



SOURCES: U.S. Bureau of the Census (1943b, 1943c, 1945, 1963).

100,000 increases of 400–500 were usual. The least change (CWRs around 200) occurred in a wide swath including all of South Carolina and extending through central Georgia and eastern Alabama. Only in one county (Cameron County, Louisiana) did the CWR decline. This county had the second highest CWR in all six states in 1930 and 1940, but a decline of 6 percent between 1940 and 1960 placed it in a moderately low fertility category in the latter year.

Although a small part of the overall increase in child-woman ratios among blacks was due to reduced child mortality and improved enumeration of children, the amount, swiftness, and variability of the increase in these six southern states can be adequately explained only by the sudden and dramatic decline of sexually transmitted diseases, the major cause of blacks' previously depressed fertility. The transformation was a consequence of the introduction of the first really efficient means of treating the diseases, beginning with sulfa drugs in the middle 1930s and culminating in the widespread adoption of true antibiotics, starting with penicillin in 1944.

Confirmation of this process lies, to a degree obvious in the differential distribution of fertility in 1960, in the beginning of a true demographic transition among the blacks of the region. By 1960, high fertility among blacks had assumed a direct relationship with poverty, a relationship that was particularly apparent in the Mississippi Delta region but extended into much of the "deepest South"—Mississippi, Alabama, and southern Georgia. By contrast, Florida, the most prosperous state, showed fertility below the average for the region; and the most industrialized part of the South, the Piedmont region, also exhibited lower than average fertility. Most of the larger urban areas had below-average fertility in 1960, although, in contrast to 1940, they did not generally represent islands of low fertility. In Peninsular Florida, the black TFR stood at 4.8, which (although below the six-state average of 5.1) was double that of 1940, when Florida was a classic example of involuntary depressed fertility. We believe that this emerging pattern of differential fertility was affected to a large extent by variation in deliberate fertility control.

IMPACT OF VENEREAL DISEASES ON BLACK FERTILITY

In the previous sections we have established the geographical linkages between fertility and the incidence of venereal diseases. It remains now to assess the quantitative effect of syphilis and gonorrhea on

black fertility. Perhaps the main virtue of the paper "Impact of VD on the Fertility of the U.S. Black Population, 1880–1950" by McFalls (1973) is the attempt to do this. In his conclusion McFalls states that, even under his "unrealistic" assumptions, which overstate the physiological impact of the venereal diseases, the spread of syphilis and gonorrhea through the black population after Emancipation could not have accounted for more than one-fifth of the decline in the TFR from 7 in 1880 to 3 in 1936.

To arrive at this estimate McFalls, building a model relating the incidence of syphilis and gonorrhea to their likely effect on the number of births, utilizes incidence levels and indices that are debatable. For instance, he accepts a 25 percent level for the average incidence of syphilis in the black population in the late 1930s; but data drawn from the results of the seriologic testing done on World War II recruits suggest that the levels of infection, among age groups well within the reproductive span, rose to 35 percent, and it may be justifiable to substitute this higher level. McFalls concludes that syphilis could account directly for no more than 5 percent of the fertility decline. We see this estimate as extremely conservative. In the case of gonorrhea McFalls denies that the disease was as prevalent as his evidence and ours suggest. He dismisses a prevalence figure three times greater than for syphilis as "most improbable," without saying why, and uses instead a multiple of two, reckoning that 20 percent of those affected became sterile. It is fairly well established that gonorrhea cases were occurring four times more frequently than syphilis, and we have noted some instances of up to eight. McFalls ascribes only 12 percent of the fertility decline to gonorrhea among black females and only 4 percent of the decline to gonorrhea among males (McFalls, 1973: 16–18). He concludes: "But if VD was not the major architect of black fertility, how can the trend be explained? This is still an open question mainly because the required evidence has not yet materialized" (McFalls, 1973: 18). Since writing that conclusion, McFalls has attempted to supplement the evidence supporting some of the other likely causes (McFalls, 1979, 1981; McFalls and Masnick, 1981).

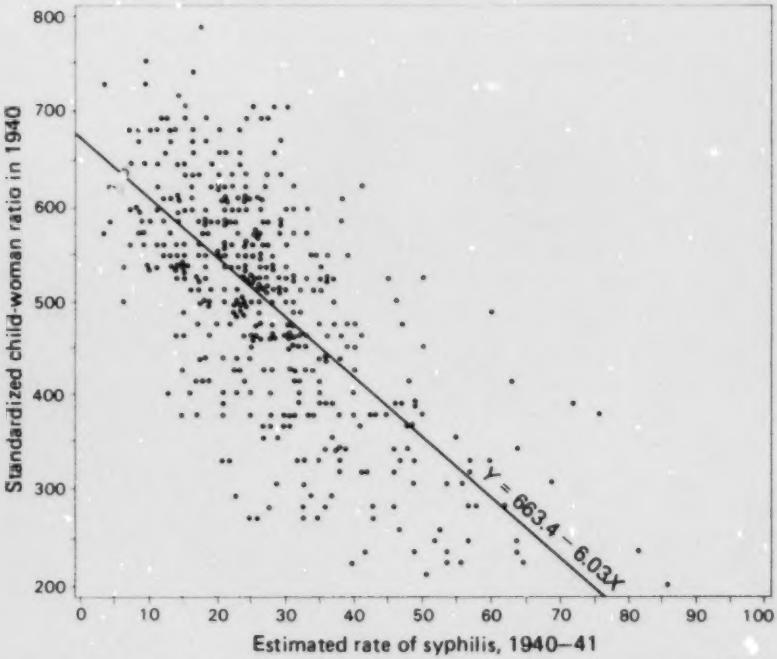
After reviewing McFalls's model and experimenting with some of our own, we came to reject his approach as being too dependent on data that are deficient, tenuous, and, in some important instances, just not available. Consequently, any assumptions based on them are bound to be "unrealistic" and to become the focus of fruitless argu-

ment. The variables used are too prone to judicious selection on the basis of one's expectations or ideology.

We believe that the possibility of substantiating the role of the traditional explanations for the decline in black fertility, which McFalls expects to account for the other four-fifths of the fertility decline, is remote. The effects of family planning, changes in marital conditions, and health problems other than the venereal diseases do not seem to be of a force to induce a decline of the magnitude observed in the decades after Emancipation. To derive a more objective indication of the effect of venereal diseases on black fertility in 1940–41, using the six chosen states as the extreme example, we have run a linear regression relating the child-woman ratio for each county to the estimated rate of syphilis occurrence (Figure 11). Implicit in this model are the following assumptions:

1. That rates of syphilis and gonorrhea are highly correlated. This assumption seems safe enough, based on the evidence reviewed, for counties with large populations, though it is subject to considerable random error where county populations are small.
2. That there is a linear relationship between syphilis rates and fertility—that is, that twice the number of cases of syphilis should have twice the impact on fertility.
3. That indicated syphilis rates can be used as a proxy for gonorrhea rates in the absence of comparable spatial data on gonorrhea. However, the ratio of gonorrhea to syphilis infections, where effective medical control is lacking, cannot be exactly linear because one syphilis infection confers immunity against subsequent fresh attacks, whereas one gonorrhea infection confers no such immunity. Even the potential effect of each gonorrhea attack cannot be the same since the crucial effect, total infecundity, can be achieved only once, and subsequent attacks would have no further effect. Overall, the result of equating the effects of syphilis and gonorrhea on fertility will be to underpredict fertility in areas characterized by low syphilis rates and to overpredict fertility somewhat where syphilis is hyperendemic.
4. That persons examined by the Selective Service boards were representative of the male population of reproductive age as a whole. As nearly all males of draft age during World War II were examined, this assumption should be generally correct for the period 1940–45, but it may not be valid for groups examined in some areas during the period covered by the data available (November 1940 through September 1941).
5. That the age structure of persons examined was similar in all counties. We have no data to verify this assumption, and undoubtedly there would

FIGURE 11. Relationship between estimated incidence of syphilis in 1940–41 and standardized child-woman ratios in 1940, by county: six-state region



SOURCES: U.S. Bureau of the Census (1943b,1943c,1945); U.S. Public Health Service (1942); Gill, Smith, and Damon (1943); Sonday (1944).

have been variation among the counties. The variation could be of importance, since syphilis is more prevalent in the age groups under age 40 than in older age groups.

To the extent that our data do not accord with these assumptions, one would expect the inverse correlation between the two venereal diseases and fertility to be reduced. Problems related to our two imperfect data sets, already discussed, would also weaken the hypothesized correlation.

The correlation between the CWR and the estimated incidence of syphilis, by county, for the six-state region is −.69 in 1940–41. Excluding Alabama, which had improbably low syphilis rates, the

correlation is −.71. The coefficient of the determination is .48, which suggests that approximately half of the fertility variation found in the counties is attributable to variation in the incidence of syphilis. All problems considered, we see the correlation of .69 to be quite high, and strong support for our hypothesis.

In this analysis, the constant in the regression equation, which indicates what the CWR should be in the absence of syphilis, is of as much interest as the correlation. We are also interested in the slope (*B* value), as it will tell us how much the CWR changes with each percentage increase in the syphilis rate. The possible errors mentioned earlier should not affect either the constant or the *B* value, provided the errors occur in a random manner.

The actual generated linear equation is CWR = 663.4 − 6.03*X*, or 681.7 − 6.42*X* if Alabama is excluded. Therefore, the CWR in this black population, if there were no syphilis, would be 663, and each percentage of increase in the incidence of syphilis would reduce the CWR by about 6. Were syphilis universal, the CWR should be about 60.

Although the CWR of 663, after we allow for high infant mortality levels in 1940, is quite substantial (in fact only 12 of the 484 counties in the study region showed higher levels than this), it is nevertheless an indication that forces other than the venereal diseases were at work in lowering black fertility.

Assuming that the CWR would have been 663 in the absence of venereal diseases, we can estimate the proportion of the total post-Civil War fertility decline that is attributable to the spread of venereal diseases. In making this estimate we convert the CWRs of the national black population in 1880 and 1940 and the predicted CWR of the 1940 "syphilis-free" black population into general fertility rates (GFR)—i.e., number of births per year per 1,000 women of ages 15–44 years.

For this purpose child-woman ratios must first be adjusted for enumeration errors among children under five and women 15–44. If mortality that has previously occurred to the 0–4 cohort is added, we get a reasonable estimate of the number of children born in the preceding five years. Dividing this estimate by the number of women 15–44, dividing the quotient by five, and then multiplying the result by 1,000 give an estimate of the general fertility rate in the preceding five years. Not all women 15–44 at the time of the census were in

that age group during the entire five-year period, but this is not a serious practical problem. The resulting estimate of the general fertility rate is fairly accurate if the estimate of births in the preceding five years and the number of women 15–44 at census time are accurate.

To estimate what child-woman ratios would have been indicated by accurate census data, we used 1880 and 1940 national black populations reconstructed by Coale and Rives (1973). For estimating mortality in the 0–4 cohort for 1880, we utilized Eblen's estimated life expectancies at birth of 33.0 and 34.3, respectively, for black males and females between 1870 and 1880 (Eblen, 1974: 307–8). The proportion of persons born who survived to be counted in the 0–4 cohort of 1880 was then estimated from model "West" life tables (United Nations, Department of Economic and Social Affairs, 1967). In estimating 1935–39 infant and child mortality, we used Coale and Rives's estimated life expectancy in 1930–39 and 1940–49 (e_0) of 46.1 and 54.0, respectively, for females and 43.1 and 50.6, respectively, for males. We conservatively estimated that between 1935 and 1940 male and female life expectancies at birth were 47 and 50 years, respectively. Again, we estimated the past mortality occurring to the 0–4 cohort of 1940 from "West" model life tables.

According to the reconstructed population of Coale and Rives, the CWR of the 1940 black population was understated by 10.5 percent (computed from Coale and Rives, 1973: 21). In addition, we estimate that the 0–4 black cohort of 1940 was reduced by about 15 percent through infant and child mortality. If both assumptions are correct, in 1940 the CWR would have been 872 in the absence of venereal diseases, undercounting, and infant and child mortality. This ratio in turn suggests a general fertility rate of 174.2 during the preceding five years. In 1880, the highest CWR on record, 759, was noted. According to the Coale and Rives reconstructed population, however, the true CWR was 849. Assuming that the 0–4 cohort was reduced by 27 percent from mortality, as the Coale and Rives estimates imply, the CWR in the absence of infant and child mortality would have been 1,180. This ratio suggests an average GFR of 236 for the preceding five years.

On the basis of these calculations we estimate that the national black GFR was 236.0 during 1875–80 and 96.7 during 1935–40. The estimated 1935–40 GFR in the "syphilis-free" black population was

174.3. Assuming an effect of zero or close thereto from venereal diseases immediately after the Civil War, one calculates that the GFR by this estimate declined 61.7 points even in the absence of a venereal-disease effect, whereas it actually declined by 139.3 points. This result suggests that 56 percent of the total decline was attributable to the spread of venereal diseases. Since a characteristic of our estimate is to underpredict fertility in areas with low rates of syphilis, this estimate may be regarded as conservative.

A regression run on the relationship of the estimated prevalence of syphilis in 1940 with the 1960 standardized CWRs by county yielded a correlation of −.22. That the coefficient of determination is only .049 shows that less than 5 percent of the variation in the 1960 CWR can be explained by areal variations in the effect of syphilis. This very weak relationship is not surprising, as the impact of venereal diseases on black fertility in the postantibiotic 1950s would have been greatly reduced.

The correlation between the estimated rate of syphilis in 1940 and the 1940–60 percentage changes in the CWRs by county (Figure 12) is .68; 47 percent of the variation in change can be attributed to the estimated rate of syphilis. This result provides further confirmation that 1940 areal variations in fertility resulted largely from variations in the incidence of venereal diseases. The regression equation "predicts" the average increase in a county free from syphilis in 1940 to be 22 percent. Because of improved enumeration of children and a lower mortality rate in 1960, the national black CWR would have increased by 19 percent had there been no change in the level of black fertility.[4] Also "predicted" by the regression equation is that, in the average county in which the estimated rate of syphilis was 33 percent in 1940, the CWR would double between 1940 and 1960.

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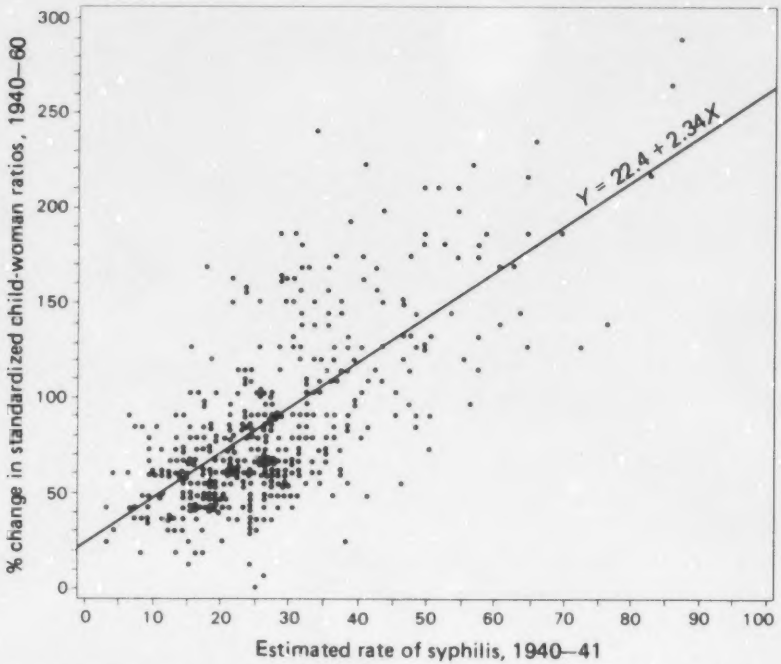
4. According to the Coale and Rives reconstructed black population of 1960, the child-woman ratio was understated by only 0.8 percent in the national census. If one assumes the life expectancies given in Coale and Rives (1973), mortality reduced the 0–4 cohort by 8.5 percent. Under these circumstances, a 1960 CWR of 439 shows equivalent fertility with the observed 1940 CWR of 368. The actual observed CWR in 1960 was 694. By using the adjustment procedures already described, we derived an estimated general fertility rate of 153.0 for the five years preceding the 1960 census. This GFR is 58 percent higher than the estimate derived for the five years preceding the 1940 census.

FIGURE 12. Relationship between estimated incidence of syphilis in 1910–11 and the percentage change in standardized child-woman ratios between 1940 and 1960, by county: six-state region



SOURCES: U.S. Bureau of the Census (1943b, 1943c, 1945, 1963); U.S. Public Health Service (1942); Gill, Smith, and Damon (1943); Sonday (1944).

COUNTERING THE THREE OBJECTIONS

The evidence assembled and reviewed here shows a fertility decline that is dramatic, cumulative, and obviously related to some powerful external factor or factors that worked with gathering intensity over the period. There is apparently a strong causal relationship between increasing levels of venereal disease and decline in black fertility, specifically in the six southeastern states, but also by implication among the U.S. black population as a whole. We have demonstrated that more than half, 56 percent as a conservative estimate, of this

decline can be ascribed to the effect of venereal disease-induced involuntary infecundity.

The fertility decline did have other contributary causes, including other medical causes such as pellagra (Farley, 1970), tuberculosis (McFalls, 1981), and malaria, as well as deliberate pregnancy avoidance, abortion, and changing marital patterns. Nevertheless, none of those factors has been shown to have the power to alter fertility levels that we attribute to the sexually transmitted diseases. To have caused the decline of the magnitude recorded, the factors, whatever they were, could scarcely have escaped notice in the literature on black social history. But none of the alternative causes, certainly not "birth control," is conspicuous in the literature.

This is also true of the venereal diseases, at least before the 1930s. They are a special case, given the hush they induced in most circles, their slow and insidious effects on fertility, and the lack of knowledge of that effect at the time. During the 1930s, by which time the impact was massive, it is possible to find a considerable amount of empirical material linking subfecundity, sterility, and pregnancy wastage with the prevalence of venereal disease among blacks. But it was not until studies of the peculiarities of black fecundity were made (e.g., by Grabill, Kiser, and Whelpton, 1958: 217; Farley, 1970: 222–26) that the causal hypothesis gained currency.

As agents of significant demographic alteration, the venereal diseases have had some difficulty in being recognized. Originally they were merely overlooked, but recently some overt skepticism of the venereal-disease hypothesis has surfaced. For instance, McFalls has been at pains to downplay, if not to dismiss, the possible effects in the case of the U.S. blacks (McFalls, 1973 and 1979; McFalls and Masnick, 1981).

> The conclusion that few blacks practiced birth control from 1880 to 1940 led many demographers to conclude that the fertility decline in this period was due almost entirely to changes in health factors prejudicial to fecundity, particularly venereal diseases. A health hypothesis was developed which stipulates, in part, that the prevalence of these health conditions increased among blacks from 1880 to 1940, thereby severely reducing their fecundity and subsequent fertility and leading to widespread involuntary childlessness, especially in urban areas. The health hypothesis, as the first available explanation of the black fertility trend, was widely accepted. This adherence to what recent critiques have shown to be a faulty hypothesis

> only served to stymy the development of a more comprehensive and accurate view of the fertility trend. Thus, the importance of such factors as birth control was overlooked for many years (McFalls and Masnick, 1981: 90).

McFalls (1973) has invoked various objections to the "health hypothesis." Some have been discussed previously and others are not strong enough to merit discussion. Three of his objections do require further investigation.

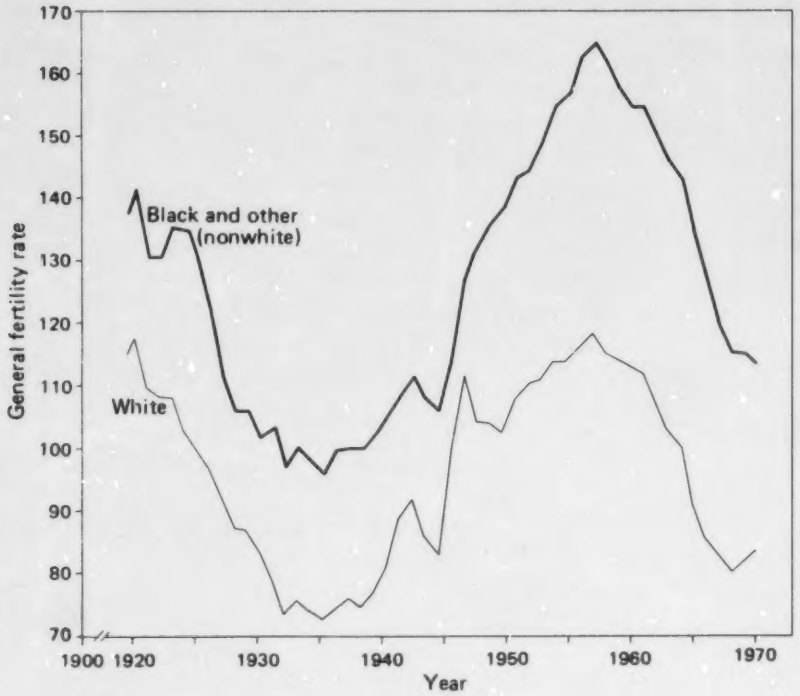
The first objection involves the timing of the turnaround in black fertility decline, which occurred before effective antibiotic treatment for either venereal syphilis or gonorrhea became available and before black communities were much affected by treatment or intervention of any kind. That syphilis and gonorrhea showed signs of some recession in the late 1930s prior to the widespread application of antibiotics has been established (see Figure 2). It is not possible to be certain about the year in which this occurred; nor was the quality of registration of black births sufficiently good to be certain of the year when black fertility reached its lowest point. It is possible to establish that the black fertility decline was reversed and the venereal-disease recession occurred at times not sufficiently different to invalidate the causal relationship suggested.

Black fertility showed a rapid decline, of about 3.0 percent annually, between 1920 and 1930, after which it declined at a slower rate over the next six years to reach its lowest level at an average fall of less than 1.5 percent annually. Between 1936 and 1945 black fertility began to increase, but very slowly, not suddenly as McFalls suggests (1973: 12). The average rate of increase was less than 1.0 percent per year. After 1945, the rate became consistent and dramatic, with a mean of 4.2 percent annually until fertility peaked about 1956 (Figure 13).

The relative contributions of the various forces likely to have been involved in the deceleration and the bottoming out of the eight-decade-long fertility decline in the 1930s and early 1940s cannot yet be specified. But the path of change is consistent with known changes in the incidence of syphilis and gonorrhea, while the extremely forceful increase in fertility between 1945 and 1957 is difficult to explain unless one invokes a rapid reduction in fecundity-reducing physiological conditions related to the progressive dissemination of antibiotic treatment among blacks, particularly those of the rural south.

The second "glaring inconsistency" raised by McFalls in objection

FIGURE 13. General fertility rates of white and black U.S. populations: 1920–70



SOURCE: U.S. Bureau of the Census (1975:49).

to the venereal-disease hypothesis is that "blacks with the socioeconomic and educational characteristics most conducive to good health had the lowest fertility and the highest childlessness" (McFalls and Masnick, 1981: 90). Not stated is that this higher socioeconomic and educational group resided principally in cities in the northern states where, as a small migrant minority (rising from 8 percent of all U.S. blacks in 1900, or fewer than 1 million persons, to 21 percent in 1940), their demographic characteristics diverged from those of the parent population remaining in the still predominantly rural south.

Even in 1940, at the end of the fertility decline, 51 percent of all

U.S. blacks lived in the rural south (ca. 6.6 million). During the first decades of the decline the proportion exceeded 80 percent. The northern, largely urban, blacks showed syphilis rates in 1941 lower than those typical of the rural and urban rates in the six-state study area, which averaged 276 per thousand for rural and 386 per thousand for urban blacks. This difference would indicate that their life-styles and access to medical care contrasted with those of their southern counterparts. Urban blacks had syphilis rates of 196 in New York State, 192 in Pennsylvania, and 217 in Illinois. Social discrimination and high joblessness notwithstanding, northern urban blacks are likely to have absorbed something of the middle-class aspirations of their white neighbors. For those same reasons, their lower fertility and greater childlessness may have been related to a conscious and deliberate desire to avoid pregnancy, particularly during the adverse economic conditions of the 1930s. This hypothesis accords well with the findings of Pearl (1937: 1387) that in New York City and Chicago, for instance, significant proportions of black women acknowledged using contraception. The diffusion among U.S. blacks of the notion of deliberate control over fertility, a trend that after 1960 came to determine their fertility levels, must have started somewhere. The large northern cities seem the most likely hearth; the rural counties of the still impoverished south, the least likely.

Among southern blacks examined by draft boards in World War II, syphilis rates were lowest among farm operators. They were much higher for all other occupations, including other rural occupations, such as farm laborers, and in urban occupations including professionals (Usilton, P. Bruyere, and M. Bruyere, 1945: 215–20).[5]

Venereal diseases appeared to have been widespread among blacks of all social classes in southern cities at the end of the fertility decline. Serologic testing of 90 percent of the adult black population of Savannah, Georgia, in 1945 revealed relatively narrow differentials by occupation and educational achievement, particularly among males. For example, although the incidence was highest for males in less skilled occupations (laborers, 454 per thousand; operative and kindred workers, 451 per thousand) and fewer years of schooling (those with less than 12 years schooling, over 400 per thousand), it was also very

5. These differences cannot be quantified here with precision because Usilton et al. present the rates by age in graph form and the graphs are poorly organized.

high for the better educated and for males in occupations requiring greater skills. Professional males over 30 years of age and "proprietors, managers, and officials" showed rates of 364 and 393 per thousand, respectively (Bowdoin et al., 1949: 135). Not surprisingly, given these levels, the county in which Savannah is located was consistently mapped in the least fertile category, but it was not exceptional among the heavily urban counties of the South (Figures 6, 7, and 8). The proportion of blacks with more than 12 years of schooling and in occupations suggesting better socioeconomic conditions was still quite low, scarcely 5 percent in the Savannah sample, and this group would have had little effect on the characteristics of the black population as a whole.

As we note earlier, fertility among rural blacks tended to be higher in counties with larger proportions owning their own farms and lower where blacks were mostly agricultural laborers. Unfortunately, no distinction is made between farm owners and farm tenants in the children-ever-born data collected by the U.S. Bureau of the Census. However, farm operators are distinguished from farm laborers. Wives of black operators and laborers in the 1835–39 birth cohort both reported an average of 7.0 children ever born and a 5 percent childlessness rate (U.S. Bureau of the Census, 1945: 27). These levels, achieved before the fertility decline got under way, are consistent with the levels associated with relatively unrestricted fertility and normal involuntary childlessness that we take to be characteristic of the pre-Emancipation period. Table 6 shows childbearing patterns among wives of farm operators and farm laborers, both white and black, whose childbearing periods were principally during the fertility decline (cohort 1905–09) and during the post-World War II recovery (cohort 1930–34). In the earlier period, black farm laborers' wives showed the highest childlessness levels and a completed family size of 1.5 fewer children than the black farm operators' wives. By 1970, among laborers born between 1930 and 1934, childlessness occurred at normal levels and laborers' average family size had increased to over six children, exceeding that of the operators by 0.5 children. By contrast, the family sizes of whites of both groups scarcely changed and that of the black operators rose only slightly.

Several studies conducted prior to World War II provide supporting evidence that the fertility of black farm-owning families was substantially higher than that of farm-tenant families. In a study undertaken

TABLE 6. Childlessness and average number of children ever born to wives of farm operators and farm laborers in the censuses of 1950 and 1970: United States

Birth cohort, age group, race, and husband's occupation	Percentage childless	Average number of children ever born
1905–09, ages 45–49		
Black		
Farm operator	13.8	5.3
Farm laborer	22.3	3.8
White		
Farm operator	12.8	3.5
Farm laborer	12.8	4.2
1930–34, ages 35–39		
Black		
Farm operator	2.7	5.9
Farm laborer	4.4	6.4
White		
Farm operator	4.6	3.6
Farm laborer	5.3	4.2

SOURCES: U.S. Bureau of the Census (1955: 90–96; 1973: 206, 213).

in the Mississippi Delta, Hitt (1942: 408) showed that, whereas 35 percent of blacks living on black-owned farms were under age 15, the comparable proportion in sharecropping families was only 28 percent. Another study (Raper, 1936: 76) indicated that, whereas the mean numbers of children ever born to black women past childbearing ages in Green and Macon counties, in the Black Belt area of Georgia, were 5.9 and 6.6, respectively, the equivalent numbers among women of sharecropping families were 4.9 and 5.3. These findings are consistent with the relationship between fertility and farm ownership suggested by the 1930 and 1940 patterns of areal fertility in the six-state area of our study. As expected, the Rosenwald serologic surveys (Clark, 1932) also showed rates of syphilis to be much higher among sharecropping than in farm-owning families. Agricultural laborers were not present in large numbers in any of the counties tested, so that no inferences can be made concerning them from the Rosenwald surveys. However,

the World War II evidence from the Peninsular Florida counties is that rates of syphilis were very high among agricultural laborers.

There is reassuring evidence that the negative relationship between venereal disease and fertility is not merely an artifact of the disease being concentrated in urban areas. If it were, one could argue that fertility would have been much lower even in the absence of venereal disease, as seems to have been partly the case in northern urban areas. The correlation between the estimated rate of syphilis in 1940 and the 1940 CWR in the 183 completely rural counties was −.70. For counties in which more than half of blacks were urban-dwelling, the equivalent correlation was −.64. In those more urban counties the predicted CWR in the absence of syphilis was only moderately lower than in the rural counties (<100 points) in 1940, suggesting that even though urban mores promoting lower fertility were working in the South, their effect prior to U.S. entry into World War II was minor.

McFalls's (1973: 18) final objection to the disease hypothesis is related to the fertility trends of both whites and blacks. These trends are so similar that McFalls contends both populations must be responding to similar stimuli. This hypothesis does not survive detailed examination. The behavior of the GFRs after 1936 shows some revealing divergencies (Figure 13). For both groups the slow increase in fertility, after the nadir of 1936, was interrupted after 1943 by a drop in births related obviously to family disruption caused by servicemen's entry into World War II. Between 1945 and 1947 a dramatic recovery occurred. For whites this postwar phenomenon was, again obviously, caused by war-parted couples making up for lost time. From 1947 to 1950 there was a slight decline in white fertility, followed by the true postwar baby boom. This new force was probably related to the long-term increase in fertility that began in the late 1930s, and it was spurred by optimism and prosperity throughout the 1950s. For blacks the trend was somewhat different. The disruption in the numbers of births occurred, on a somewhat lesser scale than for whites, during the absence of servicemen from their homes, which was followed by a rapid recovery after 1945. Instead of dropping temporarily after 1947, as did white fertility, the black trend continued to rise spectacularly to a peak in 1957, after which, again like the white, it began a similarly spectacular slide.

From the levels observed just before the effect of World War II absences occurred, white fertility rose 28 percent to its peak in 1957;

at the same time black fertility rose over 47 percent to levels not seen since 1910. We regard this as a partial return to traditional levels of fertility, the aspirations for which had never evaporated. By this time however, those aspirations had certainly been modified, particularly among the better educated middle-class blacks and in the north, where most blacks lived in urban areas engaged principally in nonfarm occupations. But the levels of black fertility at this time were still not determined by northern-dwelling, middle-class, urban blacks. Instead, the lowered fecundity of southern black women—the wives (and lovers) of sharecroppers, tenant farmers, and rural and urban laborers—was still the overriding factor.

The conclusion that the black fertility trend was fashioned by the same "traditional factors" that operated among whites is not credible. It implies that black women were willing to absorb attitudes toward fertility control from their spatially proximate white neighbors while rejecting (until about 1910) or heavily filtering (for several decades thereafter) aspirations for improved mortality control from the same source. Had significant mortality decline among blacks paced that among whites—that is, had their life expectancy shown a steady increase beginning well before Emancipation—this stance would be more defensible. Instead, black mortality showed almost no signs of improvement until after 1910 when, with an e_0 of about 32 years, it was more than 35 percent below the white level.

The causes for this discrepancy lie in fundamental differences between the two peoples, culturally, historically, geographically, economically, politically, and demographically. To accept the theory that blacks in the U.S. during the century following Emancipation were motivated to progressively reduce their fertility by deliberate means just as whites did is to underestimate grievously the segregative gulf between the two populations. The demographic processes, working on the black population until quite recently, do not have their analogs in the white population of the United States. They are to be found instead in the populations of developing countries or, more closely, in other minority populations living in close spatial but demographically and culturally separate relationship to a predominantly "modern" population. The closest parallel is probably found in New Zealand, where the Polynesian Maori component is similar in proportion to the whole population. The Maoris also had problems with syphilis and gonorrhea but not to the extent found among U.S. blacks (Pool, 1977).

Their traditional social and leadership system survived contact with whites; slavery denied blacks this advantage.

Significantly, a noticeable mortality decline among the Maori population began after 1910, virtually identical in timing to that of the U.S. blacks. Perceptible fertility decline, from levels similar to those of other Polynesian populations in the tropical islands of the Pacific rather than to those of white New Zealanders, did not begin until the late 1950s, again in timing virtually identical to the widespread adoption of intentional fertility control among U.S. blacks (Borrie, 1959).

The reasons for this parallelism bear further investigation but probably lie in technological, social, and political changes occurring more or less simultaneously in both countries. Pool (1977: 89) suggested that " 'modern' methods of contraception do not seem to have been widely used prior to 1961; although Maoris had heard of them and were sometimes interested in them, they did not possess detailed knowledge." A similar situation, we believe, existed among U.S. blacks, among whom only a sophisticated minority, mainly in the urban north, regularly practiced contraception for the purpose of achieving a small, controlled family size. For the rest the development of widespread deliberate family planning occurred only several decades after a mortality decline became obvious, in line with well-established demographic theory. We suggest that mean "desired family size" for southern blacks would have hovered about the traditional level of between six and seven children observed prior to Emancipation, rationalizations related to smaller achieved families aside, until the 1930s, when deliberate family limitation could have been expected to become sufficiently prevalent to lower the fertility curve substantially. The two curves, the potential or hypothesized TFR and the observed level, which around the year 1960 (near the top of the post-war fertility level) stood at a little over four children, may have intersected at that time.

Use of the condom, which figured so frequently in early accounts of contraceptive use among blacks (McFalls and Masnick, 1981: 91), could be related to its value as a prophylactic against venereal disease as well as its contraceptive function; and it may now be doubtful in retrospect which function was primarily intended.

CONCLUSION

The effects of the prevalence of venereal diseases among blacks after Emancipation cannot now be gauged. Without question, however, syphilis and gonorrhea must have blighted millions of lives, disrupted hundreds of thousands of families, and caused social and economic problems of tragic proportion. It is possible that, had there been no venereal disease, the U.S. black population would have numbered nearly 45 million in 1980 rather than the 26 million actually recorded by the census. This estimate omits any allowance for the extremely high rates of population growth likely to have occurred in the 1930s, 1940s, and early 1950s, if rates recorded in analogous populations are an indication. What the social, economic, and political consequences would have been of the black population's representing, say, 20 percent of the total U.S. population, rather than the current level of about 12 percent, can only be speculated upon, but it must have been profound.

The venereal diseases not only brought tragedy to black individuals and families but also probably aggravated the ethnic problems of the country, increasing the victimization of blacks socially, economically, and politically. It is difficult for us now to imagine the intensity of the dread and hostility that the risks of venereal diseases generated among the growing white middle class before the development of efficient treatment. To the anxious mothers and fearful wives who set its tone, few threats to their respectability and security were more terrifying.

The role of the recession of venereal diseases in the demographic and social reconciliation that has marked the relations between blacks and whites in recent decades has still to be objectively assessed. The previously wide discrepancy between white and black rates of venereal disease, suggested by the World War II Selective Service data to be of a magnitude 1 to 12, has been greatly narrowed, but not eliminated. The optimism about the prospects for complete control, borne of new experience with the "miracle drugs" immediately after World War II, has evaporated. Syphilis, gonorrhea, and a variety of other sexually transmitted diseases are having a troubling resurgence. Especially disquieting is the discovery that problems among blacks with STDs and their sequelae are at levels at least three times those of whites, although the explanation probably lies these days more with class differences than

with race or culture. The southern states still account for a disproportionately large share of the VD cases recorded in the United States. According to a recent estimate nearly one million women in the U.S. suffer from pelvic inflammatory disease and its effects annually, and a projection of its prevalence level indicates a doubling by the end of the century (Curran, 1980: 850–51). The problem of involuntary infecundity is still with us: Surely it should not be another case of history forgotten and then relived.

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